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Bay Area's Computer Magazine

January 22, 1990 • 65

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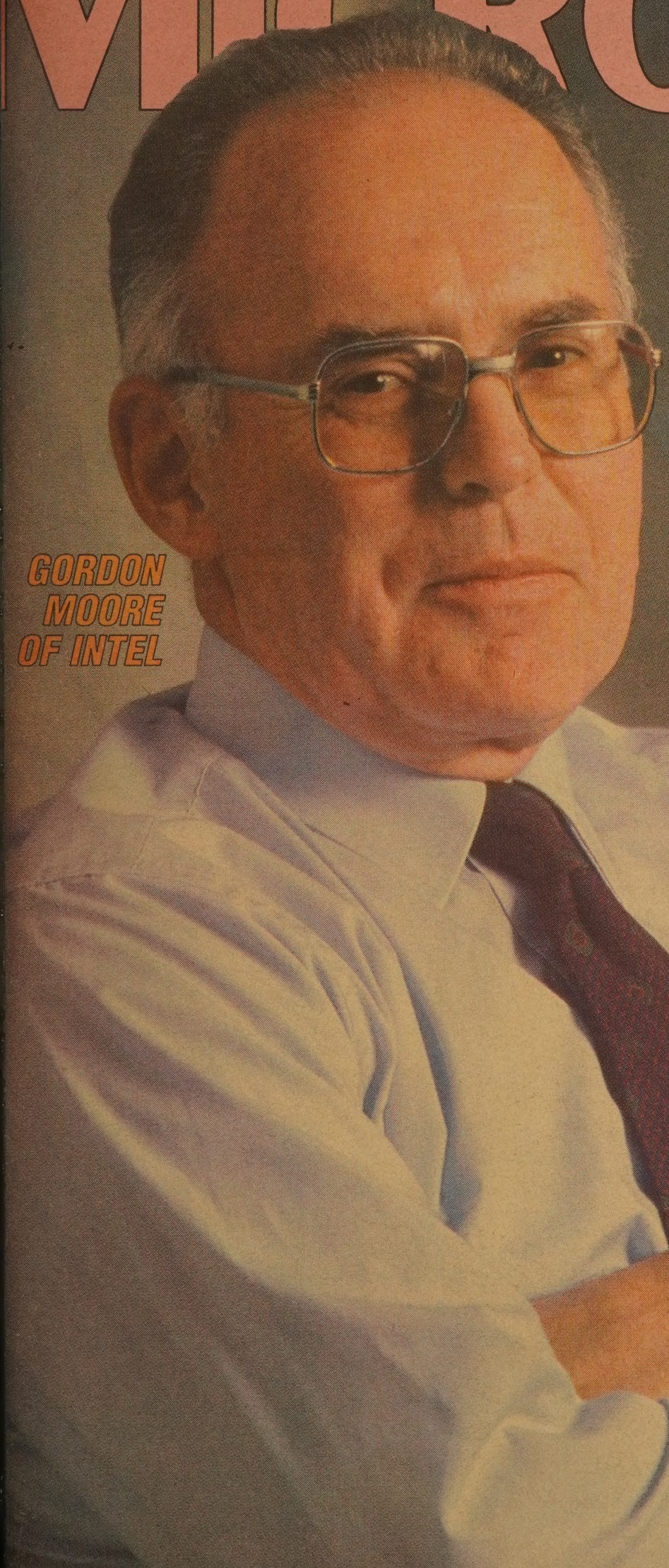

GORDON MOORE OF INTEL

YESTERDAY • TODAY • TOMORROW

INTEL

An Interview With Chairman And Co-Founder Gordon Moore

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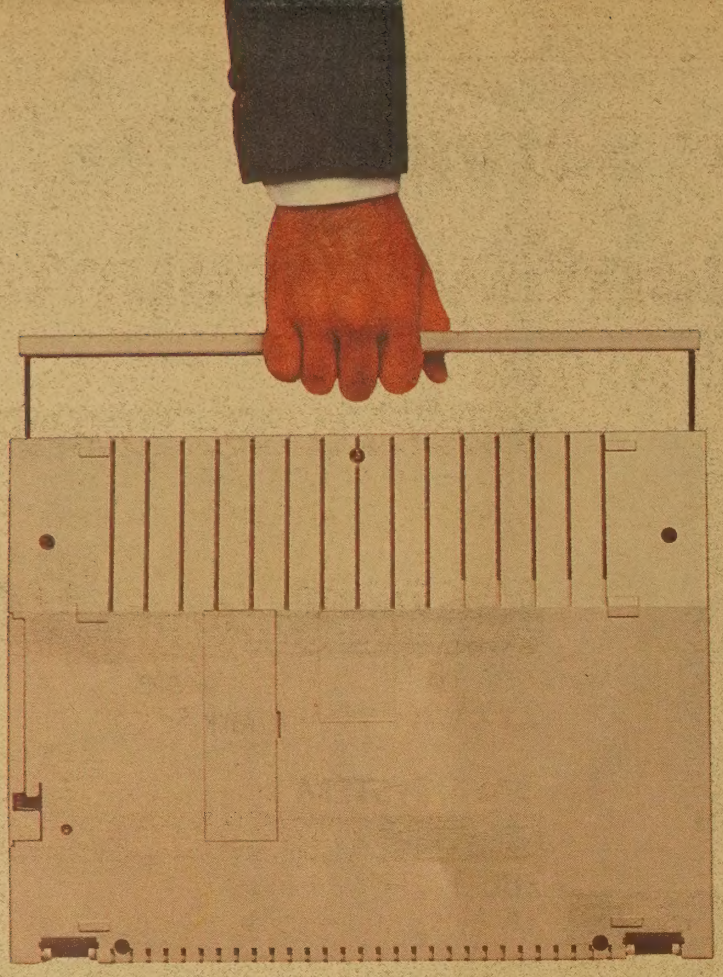
MicroTimes 100

Our Yearly List Of Industry Leaders



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You may say that sounds like a split personality. We say it sounds like the new Altima One.

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What's more, Altima One *comes with* items that other manufacturers call options. Like a built-in 2400 baud modem. Or an optomechanical mouse with a compartment for storage. Or a PC compatible expansion slot.

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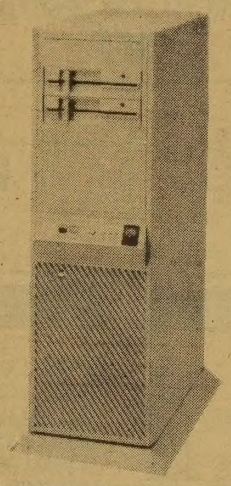

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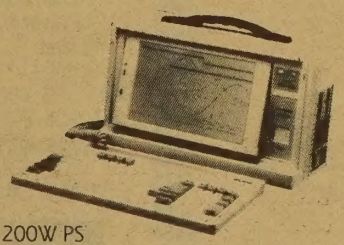

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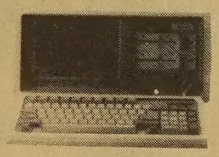

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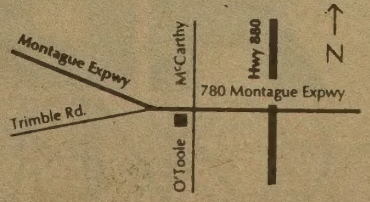

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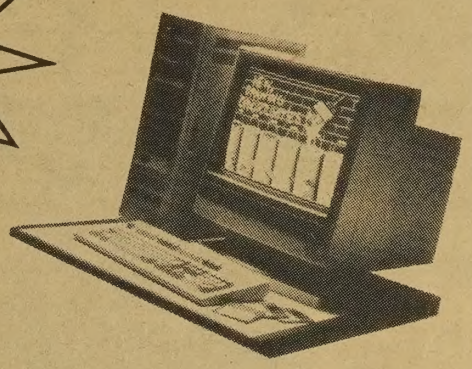

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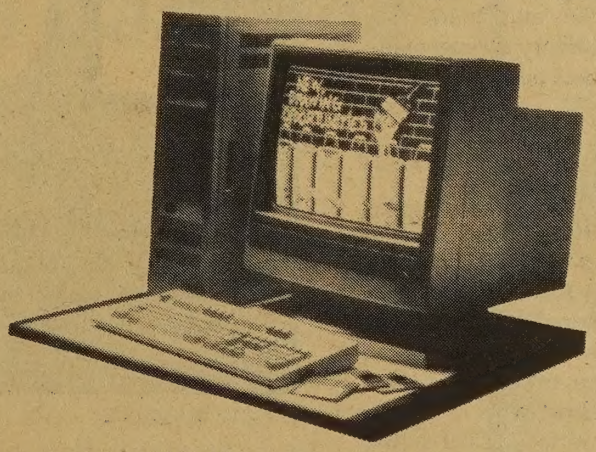

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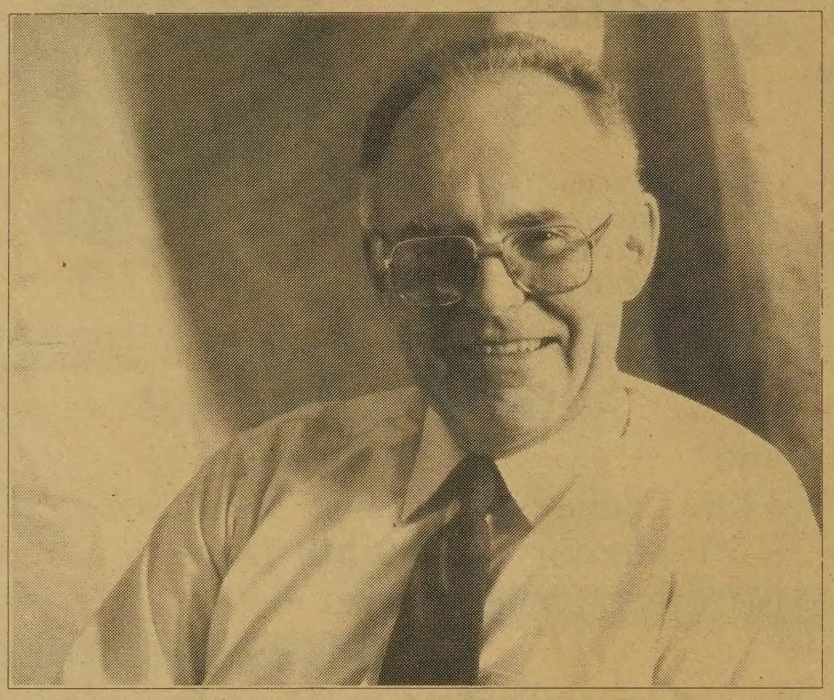

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Intel: Yesterday, Today, And Tomorrow

By Mary Eisenhart

Cover and contents photos: Michael Jay

Intel invented the microprocessor. The first microcomputer had an Intel CPU—and with the advent of the IBM PC Intel was firmly entrenched as the vendor of industry-standard processors. In this interview, Intel chairman and co-founder Gordon Moore discusses the death of 16-bit architecture (which can't happen soon enough for Intel), the 486 chip, the company's expansion into multimedia, US high-tech trade policy, and other significant matters.

THE THIRD ANNUAL
MicroTimes 100

60
The Third Annual MicroTimes 100

This year's list honors those who made outstanding contributions to the microcomputer world during 1989, from industry giants to unsung heroes.

REVIEWS

120 Books For The Entrepreneur

The Macintosh Way And The Autodesk File

By Mary Eisenhart

Two books by architects of big industry successes—the Mac itself, as told by pioneering Software Evangelist Guy Kawasaki, and Autodesk/AutoCAD, whose story unfolds in original company documents in inimitable style.

126 Toshiba T1600 Portable

By Ed Kahn

A machine that truly makes the transition from desktop to laptop.

MAC @ WORK

134 SmartForm Designer

By Mike Markowitz

Claris has come out with a great product for the paperless office. It remains to be seen whether Corporate America *wants* a paperless office.

140 BMUG

By David Morgenstern

Tetris mania, loathing and loathing at COMDEX, preview of Mac '90, and other cool stuff.

FEATURES

88 Multitasking With DESQview

Part 2

By Lenny Bailes

Using DESQview and Quarterdeck's new memory management products for best performance.

96 Being In Nothingness

Virtual Reality And The Pioneers Of Cyberspace

By John Perry Barlow

Computer-generated worlds have been the subject of speculation and research since the days of Ivan Sutherland. Now, with the price-performance ratio of CPU power getting better all the time, virtual reality is becoming enticingly "real"—and surprisingly long on practical applications.

ISSUES

38 Realizable Fantasies

By Jim Warren

Input devices, TV on your computer, and other ideas.

210 Dvorak's Last Column

By John C. Dvorak

Dvorak visits the year 2090.

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For HP LaserJet Series II & IIP Printers **Versatility in a Cartridge**

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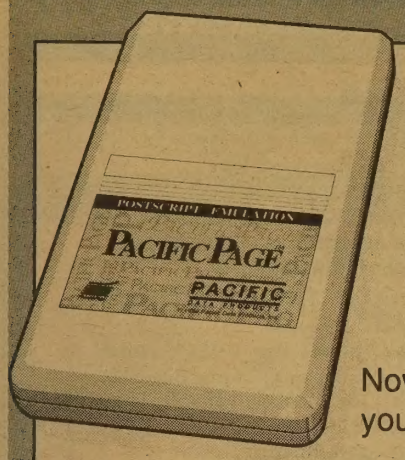

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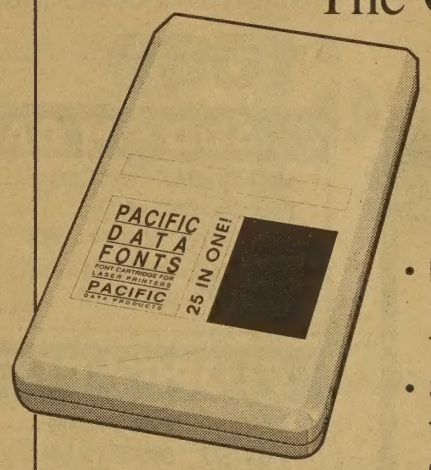

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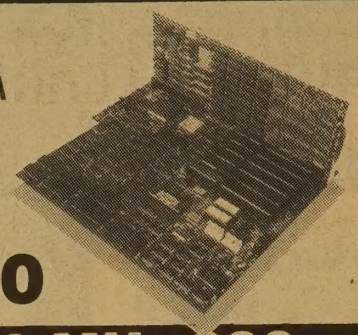

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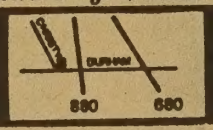

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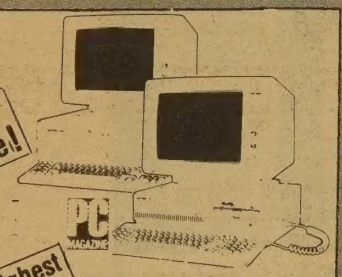

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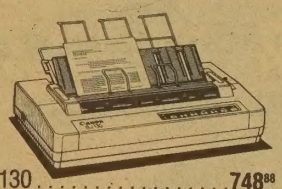

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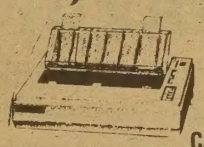

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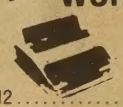

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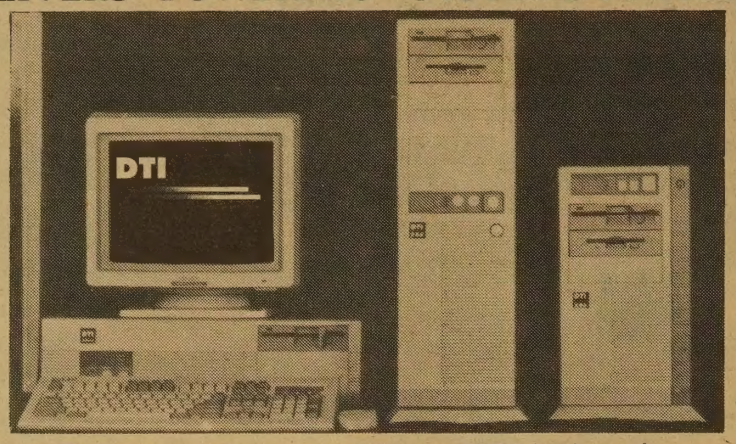

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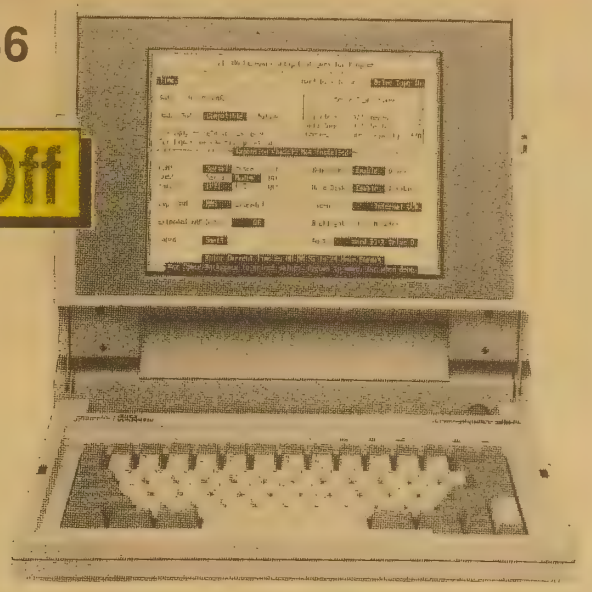

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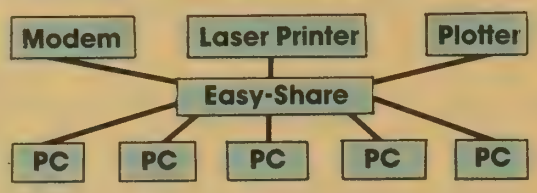

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CALENDAR OF EVENTS *continued*

January 26 NetWare 286: System Administrator Class. Emeryville. DataNet. Call: (415)465-9084.

January 26 Beginning FileMaker II Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

January 26 How To Manage The Novell NetWare Operating System Class. Oakland. DataNet. Call: (415)465-9084.

January 27 PC Repair Class. Oakland. DataNet. Call: (415)465-9084.

January 27 Computer Swap. San Francisco. Richard James. Call: 1-800-433-7469.

January 29–30 MacAcademy. Oakland. Florida Marketing International. Call: (904)677-1918.

January 30–31 Mac '90. Berkeley. BMUG. Call: (415)549-BMUG.

January 30 Basic Macintosh Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

January 30 Excel For The Macintosh Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

January 30 HyperCard III Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

January 30–February 2 Software Quality Assurance & Testing Course. San Diego. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

January 30–February 2 Network Planning, Support, And Management Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

January 31 Intermediate Macintosh Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

January 31–February 2 Alliance '90 US–Japan High Technology Conference. Tokyo. DEFTA, Inc. Call: (415)424-0940.

February 1 Microsoft Works: Database Management Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 1–3 Computers And Reading/Learning Difficulties Conference. Richmond. Computer-Using Educators. Call: Diane Frost or Gerald Block, (415)222-1249.

February 3 Installing Novell NetWare Local Area Networks Class. Emeryville. DataNet. Call: (415)465-9084.

February 3 Introduction To Graphics Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 5–9 6th International Conference On

continued

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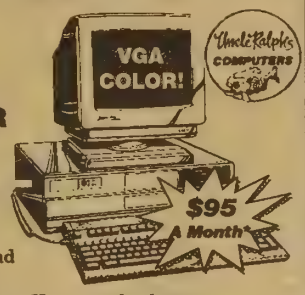
UNCLE RALPH'S/MYLEX 386SX WITH 40 MB HARD DRIVE & VGA COLOR MONITOR



You'll fall in love with this computer as soon as you use it! It's dependable, and very fast, but there's lots more. You get the best keyboard you have ever touched, a superbly crafted "accu-fit" case, parallel, game, and *two* serial ports, 1 MB RAM, and a high capacity floppy drive. You'll also get a 40 MB hard drive, VGA card, VGA color monitor, and Uncle Ralph's helpful support and service. 1 year Warranty, 2 years on the motherboard!

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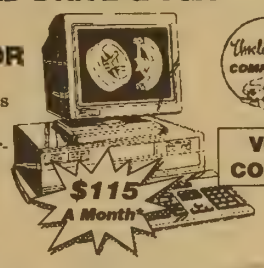

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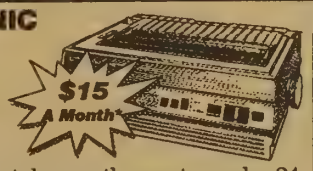

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Panasonic $299

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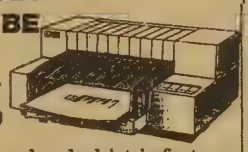

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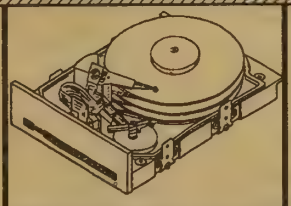

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386-16 MHZ System	1305	1320	1430	1630	1710	1785	1995	60 MB, 65 MS... +370
286-20 MHZ System	735	745	855	1055	1135	1210	1415	40 MB, 28 MS... +335
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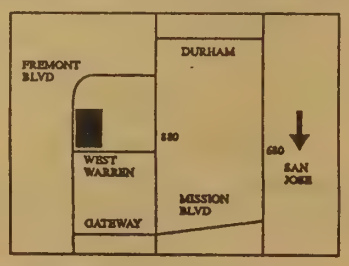

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CALENDAR OF EVENTS *continued*

Data Engineering. Los Angeles. IEEE Computer Society. Call: (202)371-1013.

February 5–6 International High Tech Forum '90. Osaka, Japan. OCL Technology Center. Call: (408)283-1010.

February 5–6 Implementation Strategies For Integrating Expert Systems Into Mainstream Computing Seminar Series. San Diego. Decision Support Technology. Call: (617)354-6400.

February 6–9 BAST Workshop. Bodega Bay. IEEE Computer Society. Call: Edward McCluskey, (415)723-1451.

February 6 Basic Macintosh Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 6–9 Software Development '90 Conference. Oakland. Software Development Seminars. Call: Cheryl How, (415)995-2471.

February 6–7 Marketing In High Technology: Integrating The Elements Of Success Seminar. San Francisco. Launch Systems, Inc. Call: 1-800-274-8587.

February 7 PageMaker, Part I Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 7 Producing Your Newsletter On The Mac Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 7–9 Thermal Printing Conference: Horizons Beyond A Decade Of Growth. Monterey. CAP International. Call: (617)982-9500.

February 7–9 Product Planning & Evaluation Course. San Diego. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

February 7–9 Animator Class. San Francisco. San Francisco State University. Call: (415)338-1205.

February 7–9 DEC Workstation Exposition '90. Santa Clara. Publications & Communications, Inc. Call: 1-800-289-EXPO.

February 8 Microsoft Word, Part I Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 8 Microsoft Word, Part II Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 8–10 Digital Photography Conference. Washington, DC. National Press Photographers Association and USA Today. Call: (703)276-3637.

February 10 Computer Mart. Cupertino. De Anza College. Call: (408)864-8581.

February 10 How To Manage The Novell NetWare Operating System Class. Emeryville. DataNet. Call: (415)465-9084.

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59 South San Jose:	6221 Santa Teresa Blvd. at Cottle, next to Lucky	(408) 578-4437•+	
1 Berkeley:	2999 Telegraph Ave. at Ashby	(415) 845-4445 +	
35 Los Gatos:	Next to Food Villa, corner of Blossom Hill and Los Gatos Blvd	(408) 356-4161•+	
38 Fremont:	Brookvale Center, 35762 Fremont Blvd in front of Lucky Superstore	(415) 791-8996 +	
14 Hayward:	2699 W. Hesperian, corner of Tennyson in front of Safeway	(415) 785-2612	
25 Cupertino:	Superstore: 1375 S. Saratoga-Sunnyvale Rd. near Prospect	(408) 725-8180•+	
33 Los Altos:	999 Fremont Blvd., at Foothill Expwy	(415) 949-1311•+	
60 Milpitas:	391 Jacklin Rd. Nob Hill Center, near 680	(408) 263-6471 +	
45 Morgan Hill:	227 Main, next to Nob Hill	(408) 779-6500•	
58 Mountain View:	El Camino at Escuela, across from Cost Plus	(415) 968-5666 +	
43 Palo Alto:	3156 El Camino Real at Portage, across from McDonald's	(415) 493-5553 +	
10 Santa Clara:	Superstore: Lawrence Square, 3581 El Camino, next to Federated, behind Chili's Restaurant	(408) 249-0952•+	
7 Santa Cruz:	Alpha Beta Center 925 Soquel Ave.	(408) 426-4865 +	
9 Sunnyvale:	Corner of El Camino Real and Hollenbeck	(408) 733-5865 +	
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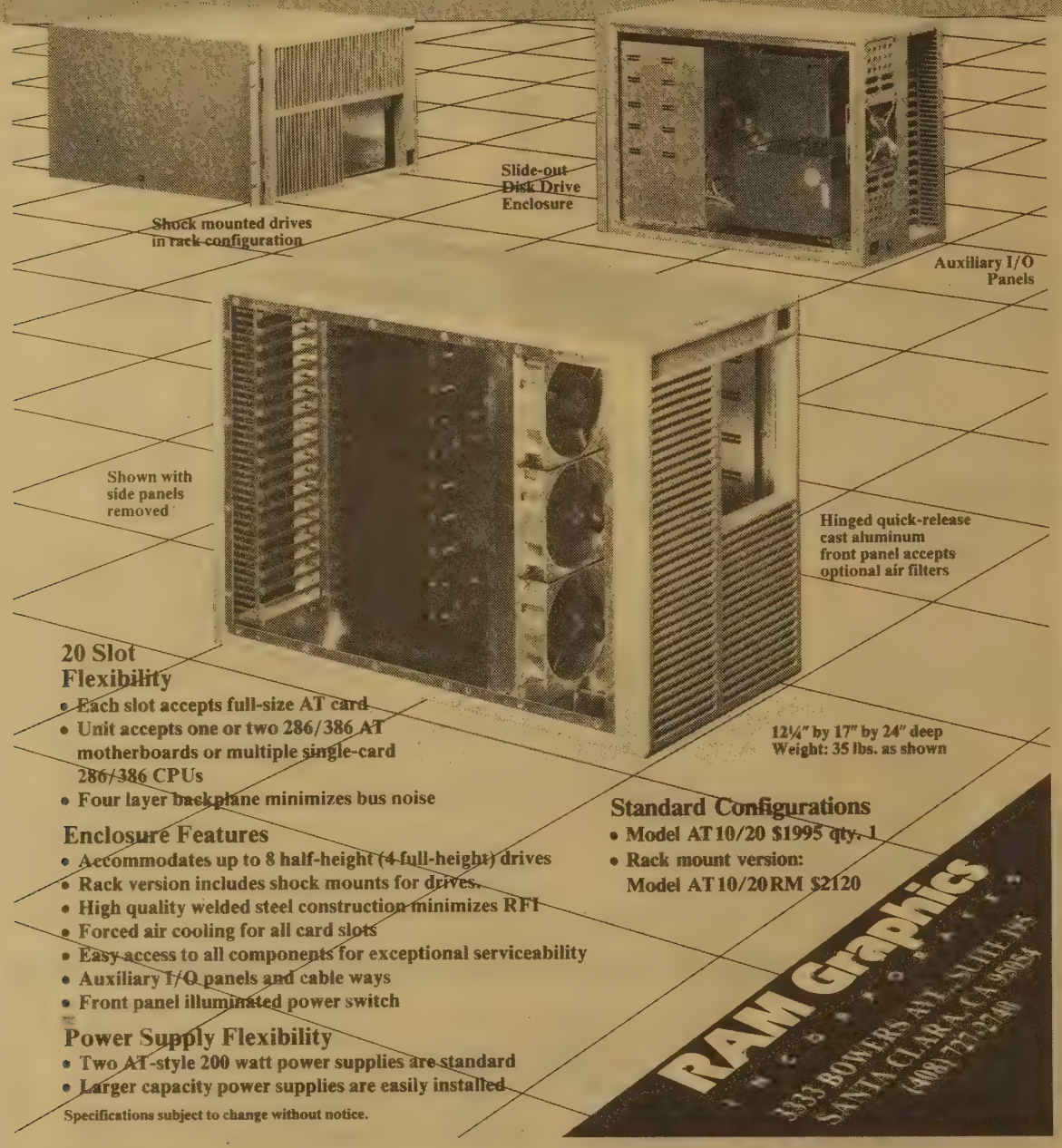
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- Four layer backplane minimizes bus noise

Enclosure Features
- Accommodates up to 8 half-height (4 full-height) drives
- Rack version includes shock mounts for drives.
- High quality welded steel construction minimizes RFI
- Forced air cooling for all card slots
- Easy access to all components for exceptional serviceability
- Auxiliary I/O panels and cable ways
- Front panel illuminated power switch

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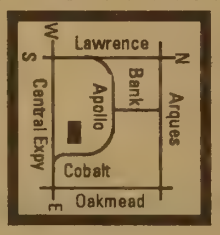

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February 10 Computer Show & Sale. Vallejo. East-West Computer Shows. Call: (415)388-8893.

February 11 Computer Show & Sale. Sacramento. East-West Computer Shows. Call: (415)388-8893.

February 11–14 Network Operations And Management Symposium. San Diego. IEEE. Call: (212)705-7857.

February 11 Basic Tax And Record Keeping Information For Self-Employed People. San Francisco. Options Institute. Call: Jan Zobel, (415)821-1015.

February 12–15 NetWorld '90 Boston. H.A. Bruno, Inc. Call: 1-800-EXPO.

February 12 MS-DOS For CAD, Level I Class. San Francisco. San Francisco State University. Call: (415)338-1205.

February 12–15 Systems USA: The OEM Systems/Subsystems Conference And Exposition. San Jose. American Electronic Association. Call: Anne Weber, (714)669-1201.

February 13 Introduction To HyperCard Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 13–16 BUSCON '90 West. Long Beach. CMC. Call: (203)852-0500 ext. 247.

February 13–16 Software Requirements & Design Specifications Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

February 13–16 Basic AutoCAD Level I Class. San Francisco. San Francisco State University. Call: (415)338-1205.

February 14 Basic Macintosh Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

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February 15 Microsoft Word, Part II Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 16 Installing NetWare 386 Class. Emeryville. DataNet. Call: (415)465-9084.

February 17 Installing Novell NetWare Local Area Networks Class. Emeryville. DataNet. Call: (415)465-9084.

February 17 Microsoft Word, Part II Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 18 Troubleshooting A Novell Network.

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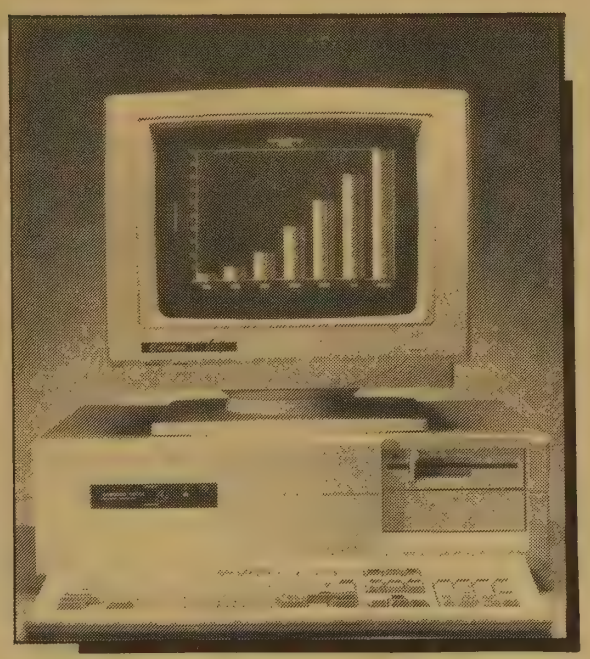

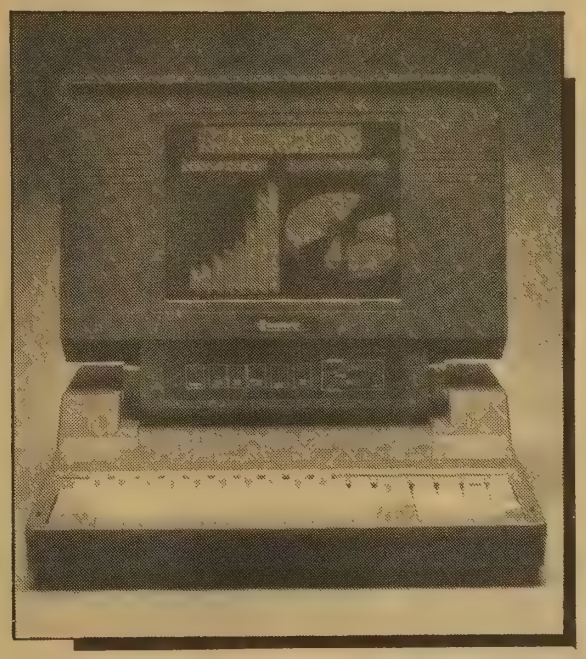

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w/20 MB Hard Disk (65 ms/MFM)	$699	$799	$849	$949	$1,199	$1,324	$1,449
w/42 MB Hard Disk (39 ms/MFM)	$809	$909	$959	$1,059	$1,309	$1,434	$1,559
w/65 MB Hard Disk (25 ms/MFM)	$899	$999	$1,049	$1,149	$1,399	$1,524	$1,649
386/16SX (1 MB)							
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w/65 MB Hard Disk (28 ms/RLL)	$1,179	$1,279	$1,329	$1,429	$1,679	$1,804	$1,929
w/80 MB Hard Disk (25 ms/MFM)	$1,349	$1,449	$1,499	$1,599	$1,849	$1,974	$2,099
386/25 (1 MB)							
Basic System	$1,049	$1,149	$1,199	$1,299	$1,549	$1,674	$1,799
w/42 MB Hard Disk (28 ms/MFM)	$1,369	$1,469	$1,519	$1,619	$1,869	$1,994	$2,119
w/65 MB Hard Disk (25 ms/RLL)	$1,449	$1,549	$1,599	$1,699	$1,949	$2,074	$2,199
w/80 MB Hard Disk (28 ms/MFM)	$1,619	$1,719	$1,769	$1,869	$2,119	$2,244	$2,369
w/100 MB Hard Disk (17 ms/ESDI)	$2,149	$2,249	$2,299	$2,399	$2,649	$2,774	$2,899
w/150 MB Hard Disk (17 ms/ESDI)	$2,349	$2,449	$2,499	$2,599	$2,849	$2,974	$3,099
386/25C (1 MB)							
Basic System	$1,549	$1,649	$1,699	$1,799	$2,049	$2,174	$2,299
w/42 MB Hard Disk (28 ms/MFM)	$1,869	$1,969	$2,019	$2,119	$2,369	$2,494	$2,619
w/65 MB Hard Disk (25 ms/RLL)	$1,949	$2,049	$2,099	$2,199	$2,449	$2,574	$2,699
w/80 MB Hard Disk (28 ms/MFM)	$2,119	$2,219	$2,269	$2,369	$2,619	$2,744	$2,869
w/100 MB Hard Disk (17 ms/ESDI)	$2,649	$2,749	$2,799	$2,899	$3,149	$3,274	$3,399
w/150 MB Hard Disk (17 ms/ESDI)	$2,849	$2,949	$2,999	$3,099	$3,349	$3,474	$3,599
	No Monitor/Card Included	VGA 720 x 400 256 Colors	SYNC 800 x 600 256 Colors	NEC 2A 800 x 600 256 Colors	HIRES (14") 1024 x 768 256 Colors	HIRES (16") 1024 x 768 256 Colors	HIRES (20") 1024 x 768 256 Colors
386/33C (1 MB)							
Basic System	$2,099	$2,599	$2,724	$2,824	$2,849	$3,549	$4,899
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w/65 MB Hard Disk (25 ms/RLL)	$2,499	$2,999	$3,124	$3,224	$3,249	$3,949	$5,299
w/80 MB Hard Disk (28 ms/MFM)	$2,669	$3,169	$3,294	$3,394	$3,419	$4,119	$5,469
w/100 MB Hard Disk (17 ms/ESDI)	$3,199	$3,699	$3,824	$3,924	$3,949	$4,649	$5,999
w/150 MB Hard Disk (17 ms/ESDI)	$3,399	$3,899	$4,024	$4,124	$4,149	$4,849	$6,199
w/340 MB Hard Disk (17 ms/ESDI)	$4,199	$4,699	$4,824	$4,924	$4,949	$5,649	$6,999
386/33C (4 MB)							
Basic System	$2,474	$2,974	$3,099	$3,199	$3,224	$3,924	$5,274
w/42 MB Hard Disk (28 ms/MFM)	$2,794	$3,294	$3,419	$3,519	$3,544	$4,244	$5,594
w/65 MB Hard Disk (25 ms/RLL)	$2,874	$3,374	$3,499	$3,599	$3,624	$4,324	$5,674
w/80 MB Hard Disk (28 ms/MFM)	$3,044	$3,544	$3,669	$3,769	$3,794	$4,494	$5,844
w/100 MB Hard Disk (17 ms/ESDI)	$3,574	$4,074	$4,199	$4,299	$4,324	$5,024	$6,374
w/150 MB Hard Disk (17 ms/ESDI)	$3,774	$4,274	$4,399	$4,499	$4,524	$5,224	$6,574
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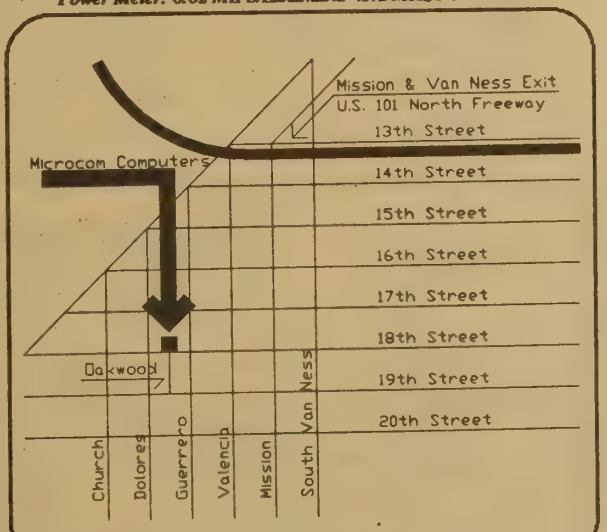

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- 1 Ser port, 1 par port, 1 game port
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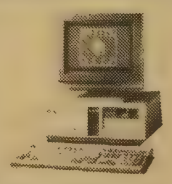

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February 21 Intermediate Macintosh Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 21 PageMaker, Part II Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 21–23 CAD For Managers Class. San Francisco. San Francisco State University. Call: (415)338-1205.

February 22 Introduction To Adobe Illustrator 88 Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 22–25 TED2 Communications Conference. Monterey. Technology Entertainment Design. Call: Bill Rosenzweig, (213)832-9396.

February 23 NetWare 386 System Administrator Class. Emeryville. DataNet. Call: (415)465-9084.

February 23 Microsoft Works: Database Management Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 24 Writer In The Workplace Conference: Strategies For The Visual Revolution. American River College. Society For Technical Communication, Sacramento Chapter. Call: Connie Warlow, (916)484-8430.

February 24 PC Repair Class. Emeryville. DataNet. Call: (415)465-9084.

February 24 Basic Macintosh Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 24 Computer Show & Sale. Oakland. East-West Computer Shows. Call: (415)388-8893.

February 24–25 AutoLisp Level II Class. San Francisco. San Francisco State University. Call: (415)338-1205.

February 25 Computer Show & Sale. Santa Rosa. East-West Computer Shows. Call: (415)388-8893.

February 26 Basic Macintosh Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 26–March 2 IEEE Computer Society COMPCON Spring '90. San Francisco. IEEE Computer Society. Call: (202)371-1013.

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February 26–27 Programming SCSI Devices Tutorial. San Francisco. Uni-Ops. Call: Walter Zintz, (415)945-0448.

February 26–27 X Window Programming With Motif Tutorial. San Francisco. Uni-Ops. Call: (415)945-0448.

February 27–March 1 The Computer And Electronic Publishing Show. Chicago. Cahners Exposition Group. Call: 1-800-255-7798.

February 27 HyperCard III Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 28 Excel For The Macintosh Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

February 28 Microsoft Word, Part I Class. Fort Mason, Bldg. D, San Francisco. Computer Alliance. Call: (415)771-1671/7133.

March 1–4 15th West Coast Computer Faire. San Francisco. The Interface Group. Call: Victor Cruz, (617)449-6600.

March 3 Installing NetWare 286 Class. Emeryville. DataNet. Call: (415)465-9084.

March 5–8 Professional Publishing Conference. Boston. Seybold Seminars. Call: (213)457-5850.

March 6–9 PC Networking: Hands-on Workshop. San Diego. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

March 7–9 Finance And Accounting For Technical Managers Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

March 7–8 UNIX And Open Systems Symposium. Toronto. Datapro. Call: (212)512-3851.

March 10 Computer Mart. Cupertino. De Anza College. Call: (408)864-8581.

March 10 NetWare 286 System Administrator Class. Emeryville. DataNet. Call: (415)465-9084.

March 11 Computer Show & Sale. Hayward. East-West Computer Shows. Call: (415)388-8893.

March 12 AISIG Meeting: The Emerging Role Of Inference-Based Data Processing. Santa Clara. Artificial Intelligence Special Interest Group. Call: Rita Zokaei, (415)574-8225.

March 13–16 Microprocessor Troubleshooting Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

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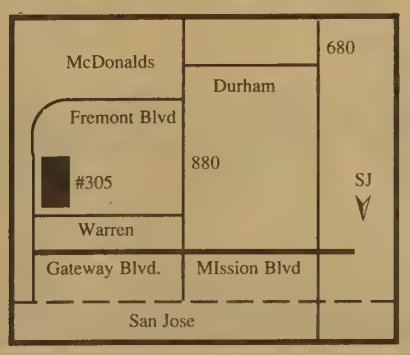

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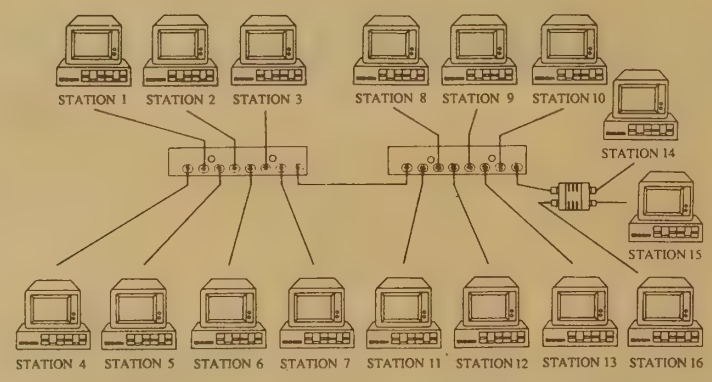

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CALENDAR OF EVENTS *continued*

March 15 Installing NetWare 386 Class. Emeryville. DataNet. Call: (415)465-9084.

March 16 Installing NetWare 286 Class. Emeryville. DataNet. Call: (415)465-9084.

March 17 Troubleshooting A Novell Network Class. Emeryville. DataNet. Call: (415)465-9084.

March 22 NetWare 386 System Administrator Class. Emeryville. DataNet. Call: (415)465-9084.

March 23 NetWare 286 System Administrator Class. Emeryville. DataNet. Call: (415)465-9084.

March 24 PC Repair Class. Emeryville. DataNet. Call: (415)465-9084.

March 25 Computer Show & Sale. Sacramento. East-West Computer Shows. Call: (415)388-8893.

March 25–28 The 1990 SPA Spring Symposium. San Diego. Software Publishers Association. Call: Jodi Polock, (202)452-1600.

March 27–29 DB/EXPO '90: The National Database Exposition And Conference. San Francisco. Norm De Nardi Enterprises. Call: 1-800-2DBEXPO.

March 27–29 Supercomputing Japan '90. Tokyo, Japan. Meridian Pacific Group. Call: (415)381-2255.

April 3–6 Microprocessor Software, Hardware, And Interfacing: Hands-on Introduction. San Francisco. Integrated Computer Systems. Call: 1-800-421-8166.

April 5–7 Leadership And Technology: A Vision Of Tomorrow Today Conference. Santa Clara. Computer-Using Educators. Call: (415)692-4300.

April 10–12 Aerospace And Defense Trade Exhibition: Finding New Markets. Santa Clara. American Electronics Association. Call: Chuck Jungi, (408)987-4204.

April 11–13 The Business Person's Computer Show. Anaheim. International Spectrum University. Call: (619)578-3152.

April 12–13 The Western Educational Computing Workshops. Northridge. California Educational Computing Consortium. Call: (415)338-1212.

April 29–May 2 International Paradox Users Conference. Monterey. Borland International. Call: (408)439-1622.

As a community service, MicroTimes *lists trade shows, seminars, and other special events in the Calendar of Events free of charge on a space-available basis. To improve the likelihood of your listing's timely inclusion, please make sure we have the necessary information no later than the first of the month, two months before the coverdate of the issue in which you'd like it to appear (i.e., the deadline for the March issue, distributed during February, is January 1). Send to: MicroTimes Calendar of Events, 5951 Canning St., Oakland, CA 94609.*

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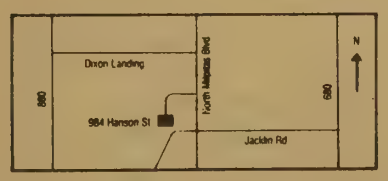

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NEWS
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BY PAUL HOFFMAN

IN THE NEWS . . .

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OS/2, Windows, And DOS At COMDEX

Confusion in the operating system universe: OS/2 is waiting in the wings while MS-DOS refuses to die.

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Other COMDEX Reports

Portables, CD-ROM,. 386/ 486, MCA/EISA, and other product news.

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on USENET (phoffman@well) and MCI Mail (264-3171). He also writes popular microcomputer books.

OS/2 And Microsoft Windows

Manufacturers Discover That Forced Reality Doesn't Work

As you have undoubtedly noticed, 1989 was not "The Year of OS/2" despite IBM's and Microsoft's best efforts. Nor was it "The Year of Windows," but Windows certainly got many more new users than OS/2 did.

Within the computer industry, however, 1989 will be remembered as "The Year the Vendors Got Pissed Off." By the end of the year, dozens of major software and hardware manufacturers had complained publicly about lack of direction in the operating system/ environment for Intel microprocessors. Their complaints got even louder after Microsoft and IBM "clarified" their stances at COMDEX. Some manufacturers feel duped into following OS/2 well before its maturity; others are angry that the majority of PCs still don't run Windows (although the percentage that could at least run it has increased). Microsoft and IBM keep giving mixed signals about both.

Why are OS/2 and Windows so unpopular? After all, they are written and supported by the largest players in both the hardware and microcomputer software industries. Unfortunately, so are other things, like MS-DOS. Like *Works.* Like XENIX. Like connectivity to much larger and more powerful hardware.

These and many products from other companies, most notably the Macintosh, put a great deal of pressure on OS/2 and Windows. Although they give ostensibly powerful features to users, they both have stiff hardware requirements. Even with sufficient hardware (something that many people do not have and cannot afford), the power of these programs is only exhibited in applications, few of which exist.

Weirdly enough, the feature most used by the few thousand people who actually use OS/2 is the compatibility box. Doesn't that tell Bill Gates something? Don't all those royalties he gets from licensing MS-DOS to thousands of hardware companies tell him something? What about the profits on the embarrassingly overpriced generic MS-DOS packages sold in stores? Remember, MS-DOS is the only popular software sold with absolutely no discount given for version upgrades. Bill Gates certainly sees the revenues from all these sales.

The industry gurus like to count what is being used by how many people report that XENIX, Microsoft's UNIX version, has more end users than OS/2. If you can't even beat out "ls" and "grep", you've got big problems.

If you wandered around this year's COMDEX, you found only a few folks touting their OS/2 software. Last year, there were dozens of signs put up by Microsoft that ostensibly pointed to booths supporting OS/2. When you got to the booth, you found that they "planned" to get on the OS/2 bandwagon. This year, there were no such signs. Running, not planned, OS/2 software was shown in about five booths. The only places where OS/2 was ubiquitous were in IBM's booth and on the soda cups where you normally see the logo of the convention hall.

Worse yet, the companies that have both MS-DOS and OS/2 versions of the same software usually only mentioned their OS/2 versions in passing. Windows applications were seen in many more places than OS/2 applications, and European vendors say that Windows is the best thing that has hit their continent. Microsoft still has not begun to ship a version of OS/2 that runs in the 80386's native mode, although they announced that it should be shipping "some time next year."

By the end of the year, dozens of major software and hardware manufacturers had complained publicly about lack of direction in the operating system/environment for Intel microprocessors. Their complaints got even louder after Microsoft and IBM "clarified" their stances at COMDEX.

At the same time, IBM announced that version 1.2 of OS/2 Extended Edition was being delayed for at least four months for "further testing." Also, Microsoft delayed releasing the long-awaited OS/2 PCL driver for Hewlett-Packard laser printers due to program bugs.

Microsoft and IBM tried to clear things up at COMDEX by making a joint announcement about who should use OS/2 and who should use Windows. What they said was that everyone should use OS/2 and only people with less than 3 Mb of RAM in their PCs should use Windows. Yes, 3 Mb. As you might imagine, this enraged developers who have been making OS/2 programs, since fewer than 10% of all

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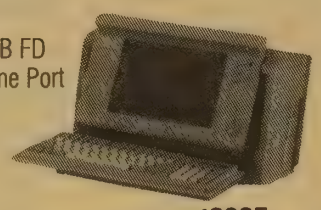

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NEWS AND ANALYSIS

PCs have 3 Mb in them, and the vast majority of those that do are running XENIX. Almost no one sells PCs with that much memory in them, leaving any potential OS/2 user faced with the daunting prospect of having to open their system and install new memory.

The companies tried to put a positive light on OS/2 by promising to release OS/2 versions of graphical programs before Windows versions. Then, in a gesture that drew righteous anger from many Windows developers, Microsoft promised to cripple Windows by not advancing it with technology like a flat memory model or long file names. Gee, thanks, Bill.

To further muddy the waters, integrated software has become easier to use and more powerful every

Even with sufficient hardware (something that many people do not have and cannot afford), the power of these programs is only exhibited in applications, few of which exist.

year. Leading the pack is Microsoft *Works*. If you only need lightweight word processing, database, and communications, a PC and this one package will probably keep you going for years. The endless media babble about the need for inter-program communications and a common user interface will probably be lost on you, since *Works* (or any of its competitors) already provides just that. Of course, it runs well in 640 K and only costs around $125 retail. Why bother to spend thousands of dollars upgrading hardware and software when what you need is already there?

New leading-edge software is being developed for MS-DOS every day. For software that has what the developer considers an innovative interface, Windows and OS/2 get in the way quickly. MS-DOS is not following the example of CP/M in dying quickly and forcing users to upgrade hardware. Pundits have come up with dozens of "explanations" for this, but the reasons are not important. Simply by guessing wrong about the trajectory of MS-DOS, Microsoft looks a bit geeky when it incessantly touts the powerful features of the packages that few people are interested in running.

The spirit of I'll-believe-it-when-I-see-it stands up pretty well compared to a marketing campaign aimed at the propeller-heads who write the big packages. If new software runs under Windows or OS/2, it rarely displaces existing MS-DOS applications. Even when it does, you can bet that the person running in those environments goes back to plain

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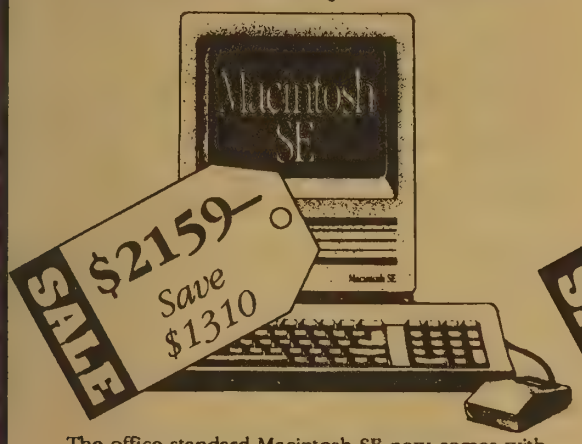

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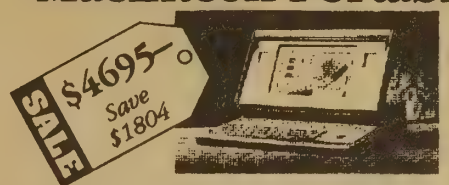

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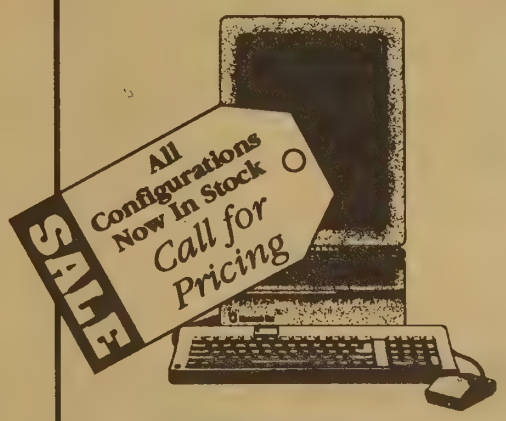

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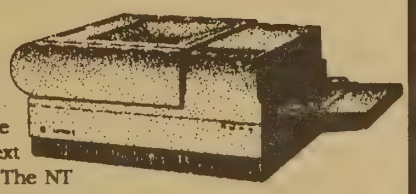

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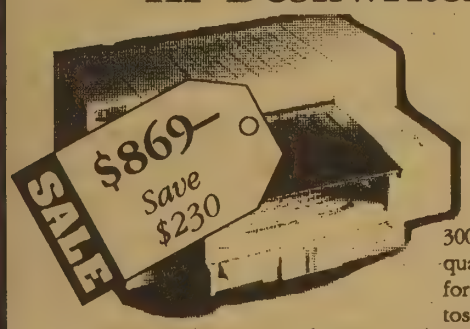

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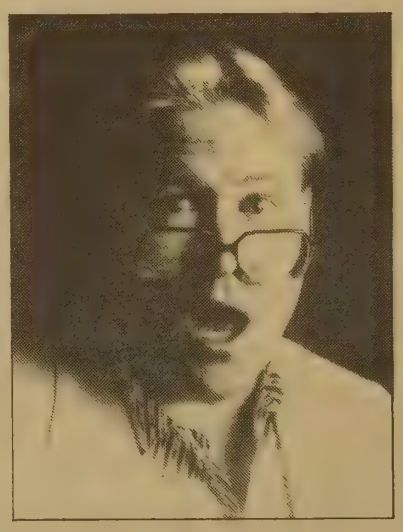

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NEWS
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The industry gurus like to count what is being used by how many people report that XENIX, Microsoft's UNIX version, has more end users than OS/2. If you can't even beat out "ls" and "grep", you've got big problems.

old MS-DOS a few times a day. If a manufacturer comes out with both Windows and OS/2 versions, the Windows versions lead the OS/2 versions by many months.

Everyone laughed when they saw how hard it was to write software for the Macintosh. They aren't laughing anymore. Writing for Windows and OS/2 is even harder. So hard, even Microsoft screws up. *Excel* for OS/2 violates one of the most important tenets of OS/2 programs, namely that it should let the user switch to another program whenever he or she feels like it. To do this, you either need to program with "multiple threads" or do some fancy checking. *Excel* for OS/2 does neither.

Programming for the Windows user interface is almost as difficult as for OS/2, and you can see it in the jerky response of most programs, even on ultra-fast PC systems running on 80386 CPUs.

The Early Death of MS-DOS, then, has not been as tidy as Microsoft predicted (and presumably wanted). The twin replacements are there, but the customers aren't. In 1985, Bill Gates and Don Estridge sincerely wanted Windows to essentially replace the user interface for MS-DOS and all programs that ran under it. But Windows was released horrendously late, and most of the people who wanted monochrome and a mouse had already gone to the Macintosh. By the time Windows was ready, the marketing machine at Microsoft had already begun singing the praises of OS/2.

Confused users decided to wait a year to see what the double standard meant. A year passed and what they saw was more marketing for OS/2, only one major Windows-based package (*Excel*), and much more software available on the Mac. A year after that, more of the same, and almost no new Windows software. The MS-DOS software market is proliferating, all segments are holding their own, dozens of small companies with utilities to "extend" MS-DOS are thriving, and Microsoft has yet to finish *Word* for Windows (and *Word* for OS/2 is months away).

Of course, MS-DOS is popular. Other, more "advanced," operating systems draw fanatics, but certainly not in the droves that buy into MS-DOS. It

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Desktop/ Tower	Desktop	Desktop	Desktop	Desktop	Desktop/ Tower	Desktop/ Tower	Laptop
Landmark	10	15.7	18	25.4	40	53.3	15.3
MIPS	1.6	2.5	2.8	3.64	5.9	7.94	2.41

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Hi-Q TOWER 33 MHz 386 SYSTEM

Landmark = 58.5 SI = 45.9

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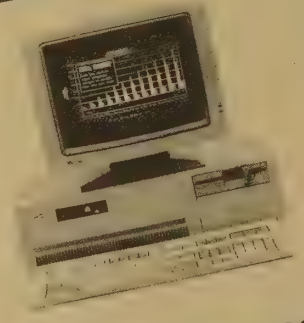

Hi-Q 20 MHz 386 SYSTEM

Landmark = 25 SI = 23

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- 1.2 or 1.44 MB Floppy Drive
- 1:1 Interleave Hard/Floppy Disk Controller
- 80387 Socket
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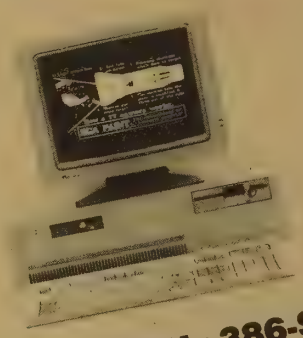

Hi-Q 16 MHz 386-SX SYSTEM

Landmark = 19.5 SI = 18

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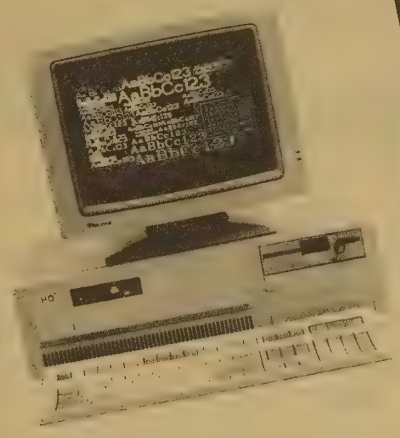
Landmark = 34.5 SI = 29.5



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- 1.2 or 1.44 MB Floppy Drive
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- 80387 Socket
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- 2 Serial, 1 Parallel, 1 Game Port
- Real Time Clock/CMOS Memory w/Battery Back-up
- 230W Power Supply & Quality Case Holds 5 Drives
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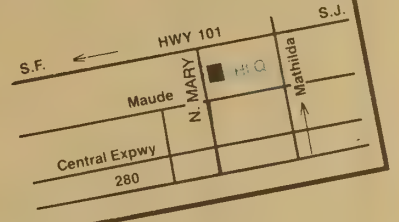
- Supports – MSDOS, OS/2, PC-MOS/386, UNIX, XENIX, DR-DOS, Concurrent DOS 386



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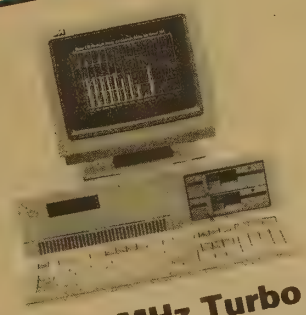

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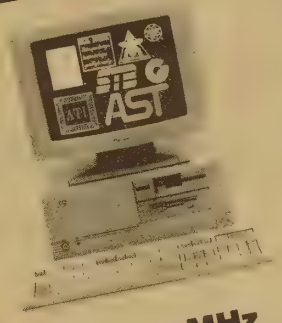

Hi-Q 12 MHz 286-AT SYSTEM

Landmark = 15.9 SI = 13.4

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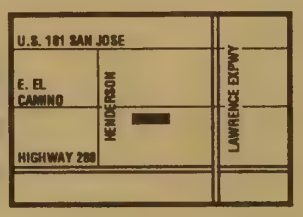

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NEWS AND ANALYSIS

is the operating sytem of choice for more than ten million people. Most UNIX systems have MS-DOS emulators; none (other than Apple's) have Macintosh emulators, and none at all have Windows emulators. The lack of people wanting to emulate Windows and OS/2 should be a sign to Bill Gates.

Compounding the problem, it takes more than a paragraph to describe the advantages of Windows or OS/2. Many MS-DOS users don't have that kind of tolerance. Sure, they'll get it when it seems like everyone else has, but they'll only listen if you can explain it in a sentence or two. After all, that's all that was needed for most of the software they run. The vast majority of MS-DOS users don't even notice MS-DOS: it's just "there" for them.

Now, programmers are complaining about Win-

Microsoft and IBM tried to clear things up at COMDEX by making a joint announcement about who should use OS/2 and who should use Windows. They said everyone should use OS/2 and only people with less than 3 Mb of RAM in their PCs should use Windows.

dows and OS/2. To Microsoft's credit, they never claimed the transition from character-based MS-DOS to Windows would be easy or quick. They did, however, promise that the transition from Windows to OS/2 would be, and they were wrong. Even OS/2 programming books from Microsoft Press admit this.

When it became obvious to many programmers that Microsoft had oversold the ease of transition from Windows to OS/2, most decided that it would be prudent to simply jump to OS/2, bypassing Windows altogether. This caused a dearth of Windows packages, making it look all the less necessary for the typical user. Now those companies are livid about how many more computers are running Windows than OS/2, about how slow Microsoft has been to improve from the initially limited power of OS/2, and about how they were "fooled" by Bill Gates.

Of course, all these companies do their own market research. They could have asked a few real people when they wanted to upgrade, and to what.

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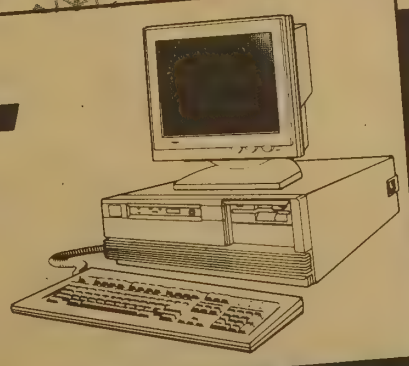

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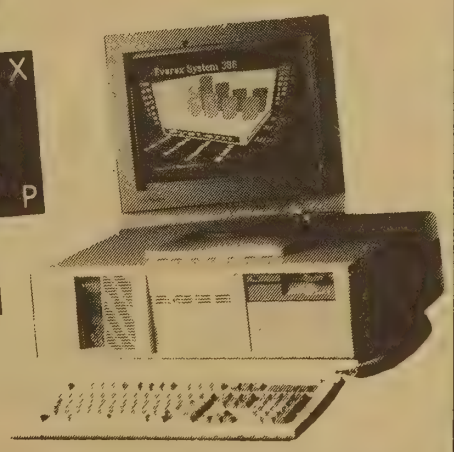

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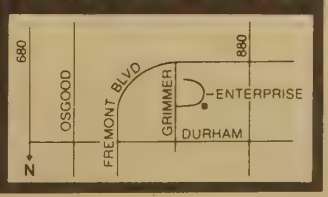

OS/2 to become dominant soon. The requirements for OS/2 are even more stringent than those for Windows. If the standard setup for the most popular operating environment costs twice as much as the standard for good old MS-DOS, guess who profits? Hardware manufacturers were ecstatic when Microsoft announced that 640 K was required to do anything useful in Windows. Speculation is that Windows version 3 will require one megabyte or more to run common Windows applications like *Excel* and *Word*.

Software that requires more RAM and a faster CPU to perform the same tasks as standard MS-DOS programs forces users to spend hundreds of millions of dollars a year more than they would have normally. Right now, to do useful work in OS/2, you need a very fast 80286 or a 80386 and at least 4 Mb of memory. Of course, Microsoft and the hardware manufacturers insist that this all eventually benefits the end users.

The Early Death of MS-DOS, then, has not been as tidy as Microsoft predicted (and presumably wanted). The twin replacements are there, but the customers aren't.

The good news? It's still the users who are calling the shots in the battle. Some have migrated to the Macintosh, while a much smaller number have migrated to UNIX (primarily XENIX) systems. When you "need" to switch to one or the other, you'll know it. You'll feel pushed, not pulled. So far, the marketing pull is certainly there, but few are feeling much of a technology push. Novice users are generally fighting the push as long as possible because the push is into an unknown void.

Given that three and a half out of the four possible directions are controlled by the same people who created the forced migration (Microsoft controls the future of OS/2, Windows, XENIX, and all the most popular applications on the Mac), it's no wonder that many people are skeptical about leaping ahead on Bill Gates's constantly changing advice. For most, the first huge step of buying and learning MS-DOS applications was enough for a lifetime; buying lots more hardware and learning a host of new terms and concepts isn't anything they're about to do willingly.

Other COMDEX Reports

The "news" about OS/2 and Windows didn't make much of a splash for most COMDEX attendees. In fact, not much news could be found at the show, even though over 120 thousand people were there buying, selling, poking, and questioning. Instead of making big announcements at the show, most manufacturers had made their announcements earlier in order to draw people to their booths to see the new products.

This certainly worked for companies making the new tiny portable computers, as well as those making low-cost laser printers. This year's COMDEX was the first time many dealers got to see and feel the two brightest stars on the portable market, the Poquet computer and Compaq's new LTE portables.

The Poquet was being shown in the Fujitsu booth, since Fujitsu owns 38% of Poquet and has promised to supply any parts that they cannot get in sufficient quantities if the demand heats up.

Compaq's LTE and LTE/286 were also big hits, due mostly to Compaq's name and the fact that the portables were easier to fix than most of the ones offered by other companies. Compaq promised that repairing the LTEs would be especially easy due to their modularity.

The CD-ROM revolution has almost petered out, but HeadStart, part of electronics giant Philips, is trying almost single-handedly to keep it alive. HeadStart showed two new, low-cost systems that come with CD-ROM players built in. The 8088-based LX-CD comes with both a 40 Mb hard disk and a CD-ROM player and costs only $2,000. The system includes MS-DOS, a word processor, paint program, educational software, hard disk utilities, and 30 games on the hard disk. It also comes with the Grolier encyclopedia, Microsoft *Bookshelf*, an atlas, and a database of 100 thousand business names and addresses on CD-ROM. For $1,000 more, you can get the III-CD, which is the same system with an 80286, more RAM, a modem, Microsoft's *Small Business Consultant* and *StatPack* CD-ROMs, and *Framework II*.

Both carry 18-month warranties, and the III-CD has an on-site service warranty as well. Philips is hoping that the low price and huge amount of software in the system will get its foot in the door for many retailers, and that the two will become the clones of choice for more people.

Data backup is finally becoming a more popular concept, and Sentry is taking advantage of that with a new model of data safe. The Media Chest 1710 holds approximately 60 3 1/2" diskettes or 30 5 1/4" diskettes and will protect them from a fire of 1550 degrees Fahrenheit for over half an hour. Sentry pointed out that most fire-proof safes are meant to keep paper from burning, but the interiors reach temperatures that would certainly damage diskettes. Their Media Chest series guarantees to keep the contents at a much lower temperature than standard fire safes so that the diskettes or tape cartridges don't melt or warp.

Topics that most people thought would be important pretty much were ignored by most of the dealers attending the show. The new 80486 computers and motherboards drew a collective yawn, since there is no software that takes advantage of the chip's capabilities and the systems were much more expensive than 80386-based clones. Although over a dozen manufacturers were showing 80486 systems, it was impossible to tell whether the much-higher prices would be worth the speed increases.

In previous years, dealers wanted to be sure to carry the very latest in technology, so they scoured the show for the biggest and the best. In the last few years, however, they've been burned often enough that they now want the most established and safest.

The MCA/EISA debate raged in the booths, but not on the floor. Many companies were showing new EISA-based systems but, again, it was impossible to tell what good they were, since no one had any add-in boards that could show off the advantages of EISA. As expected, the EISA systems were much more expensive than standard clones.

Only one product didn't look like it was designed for the me-too crowd. A tiny Japanese manufacturer called Data Mate showed the largest computer-controlled color printer available. The Michelangelo prints in four colors on any surface up to five feet by five feet with an accuracy of two millimeters per pixel. The ink is an acrylate resin that can be used on cloth, tile, wood, glass, paper, or metal. The uses include advertising, customized displays, wall hangings, and so on. Data Mate was at COMDEX looking for an American distributor (the maker of their inks, a Dutch company, already locked up the EEC market).

Data Mate expects the units to be sold to graphics art producers such as large print shops, who will then contract jobs for clients.

Computer dealer sentiment at the show shifted from one of anticipation to one of simple acceptance. In previous years, dealers wanted to be sure to carry the very latest in technology, so they scoured the show for the biggest and the best. In the last few years, however, dealers have been burned often enough that they now want the most established and safest (at a low price, if possible). This year's COMDEX didn't show them much that was new, so they were content to haggle over margins and delivery schedules with their suppliers.

Interestingly, many dealers were asking Apple about becoming authorized Macintosh dealers, since the Mac is now drawing crowds of businesspeople. When OS/2, EISA, and the 80486 become more real, the dealers will pay more attention. Until then, they are happy selling two lines of clones (high-end with big names and low-end with no names) and the standard software. ■

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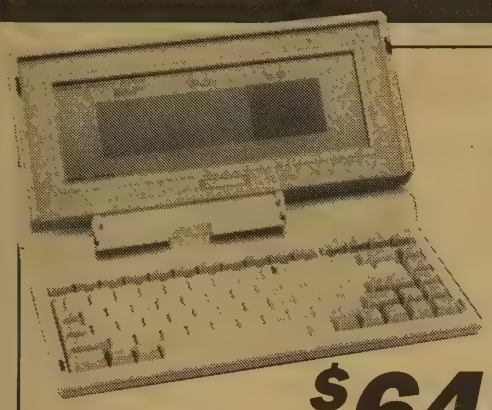

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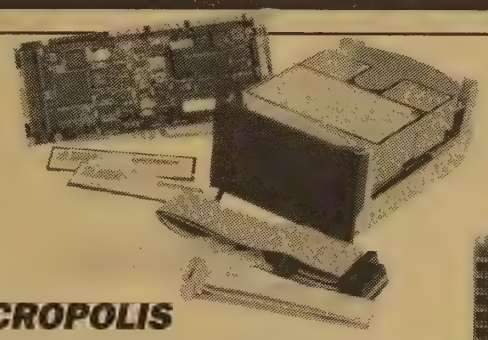

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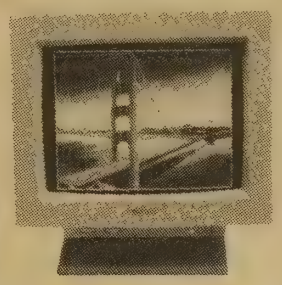

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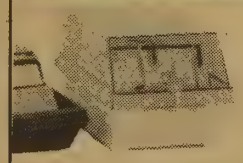

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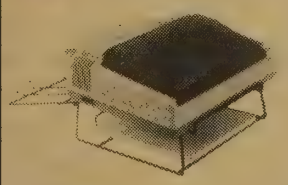

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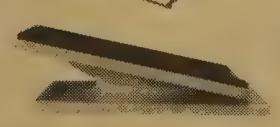

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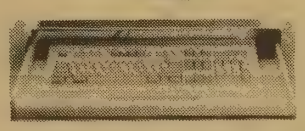

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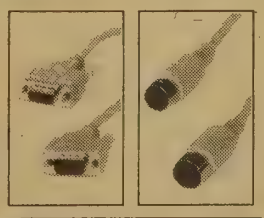

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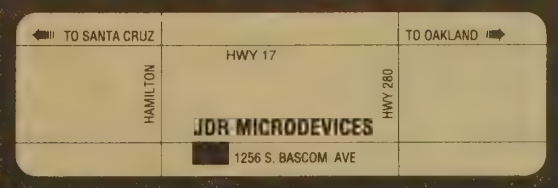


Keyboards, Satellite Photos, HDTV And More

After my column suggesting alternative keyboard shapes, Bill Dietrich of Sunnyvale proposed further innovation:

Keyboards need not be solid. How about an open rectangle, scanned by a matrix of infrared beams that detects when your fingers appear where? Keycap labels could be on a sheet below the rectangle (allowing easy re-labeling). Fancier keycap images could be projected holograms.

This might be the ultimate in noiseless, compact, lightweight keyboards. Problems include that it lacks a "resting position" and tactile feedback. For touch, Bill suggests an inflatable plastic bag—like the dimple material used for packing—below or around the light beams.

Hmmm—an inflatable keyboard?

Reaching Into Space

Take it a step further: How about an 3-D "untouchable" volume, rather than simply a two-dimensional area? It might be a "keyboard" for controlling solid modeling, 3-D CAD, music, robotics, orchestrated light shows...

Orchestra conductors have long used batons for imprecise variations on this theme.

Steno Briefly

My keyboard column also punched Larry Salmon's button. He sent info on his Abbre-V-8 shorthand software (707-937-4298, Comptche, CA). Probably frightening to spelling teachers, it allows abbreviations to be quickly keyboarded while appearing as full-text. "T" becomes "The,""u" becomes "you," etc.

Perhaps computer users with klunky KWERTY keyboards can now type at the speed of speech, as do court reporters.

For An Overview

There's a group in Canada—Advanced Satellite Productions (Richmond, BC)—that produces absolutely magnificant hi-res, large-size color prints of small areas of the Earth, using digitized satellite camera data that is available to the public. Their photos-for-sale cover "small" areas—San Francisco Bay area, Puget Sound area, Seattle area, etc.

I hear they are one of the only companies to perfect this processing—presumably excluding NASA, CIA, DoD, the Drug Enforcement Agency and other government agencies wanting to watch US and foreign citizens.

As I recall the conversation, ASP does their processing on a mainframe. Well! That was several years ago—so it's now time for entrepreneurs to do it on micros. May as well offer the database on a CD-ROM, plus programmable products for user manipulation.

HDTV Doesn't Need Government Funding

Lotsa hands-out hustlers are rushing to Congress, pleading to have taxpayers pay for them to develop high-definition television. Riding the current hobby-horse of Japan-bashing, they say United States companies can't compete with Japanese innovation unless government—meaning you and me—pays for it. (Wonder how Edison, Bell and Ford would have viewed this professing of incompetence on the part of American business?)

But: We almost have full-motion video on hi-res color microcomputer monitors—at almost consumer prices—right now. And, if it's almost here, almost at consumer prices—now—it's sure to be a computer consumer product, soon. Its greatest problem may be getting the FCC to adopt national format standards that are robust and practical.

While the bucks-hustlers grovel in Washington—touting American incompetence in the face of "superior" Japanese—many of our real producers and innovators are going ahead and doing it.

If Congress will just drag its feet long enough, we'll get HDTV without government intervention, without having to pay for it through taxation—and without supporting the idiotic belief that American innovation can't compare to the Japanese unless its done with government handouts. Grrrr!

For HDTV: An Open Architecture

It's time that consumers' television and video products were programmable.

Folks from MIT's Media Lab are proposing an "Open Architecture Receiver" (OAR) for HDTV. (Stanford! UCLA! UC-Bezerkly! Why aren't you in the forefront of this idea?)

MIT proposes that digital processing architecture of video signals be open and programmable. (Note that high-end consumer televisions and VCRs already offer some amount of user programmability by digitizing the video—for picture-in-picture, home editing, etc. And it's getting cheaper-per-capability, fast!)

Using almost-available microprocessors, an open architecture would allow unending innovation and enhancement, strong competition, and major consumer benefits. And it would create a huge market for computer industry talents. It would also protect consumer video products from obsolescence. (Some manufacturers may be less than enchanted with that idea.)

Enhancements could often be added by simply loading new software, or perhaps changing only a ROM or CPU.

Tell the legal beagles in Congress to ignore the big-bucks special interests, at least enough to avoid suppressing OAR. Then, OAR receivers—with nominal planning ahead—can accept current NTSC signals, plus whatever reasonable HDTV format is eventually adopted—even including multiple formats. Consumers can have long-lived products with economical, incremental add-ons for PIP, zoom, pan games, education, telecomm, editing—and video control we haven't yet dreamed of.

Personal computer makers! Do you realize how big a market you could expand into, if you offer consumer television output on your consumer-priced computer?

In The Meantime, Do It With Computers

Personal computer makers! Do you realize how big a market you could expand into, if you offer consumer television output on your consumer-priced computer? Offer "two for the price of one"—a computer *and* an upgradable IDTV (improved-definition television). Plus programmability for add-on features, games, interactive instruction, video processing, etc.

Be the first company on your block to offer full-motion video on your hi-res computer system's screen, with stereo.

Start with some off-the-shelf television receiver and VCR input module. Route the audio to stereo jacks. Translate the RF, RGB or Y-C teevee video to your computer's hi-res display. (We software types know this is a simple weekend's design job for any competent solder jockey. Uh huh!)

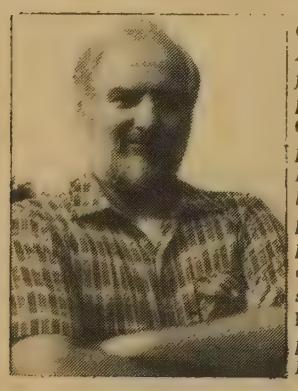
Remember The Typesetter Lesson

Computer makers using laser printers grabbed a huge market share away from turgid traditional typesetter manufacturers—who are still playing catch-up, often offering obsolete technology and capabilities at excessive prices while past customers flee to our computerworld.

The hi-end TV market offers the same opportunity—but some also-rans undoubtedly will continue to foolishly believe that video signals don't contain information worth processing.

Forward Fancy Fantasies

Send suggestions to Jim Warren, Realizable Fantasies, 345 Swett Road, Woodside, CA 94062. Published proposals will be attributed to their authors unless anonymity is requested. ■



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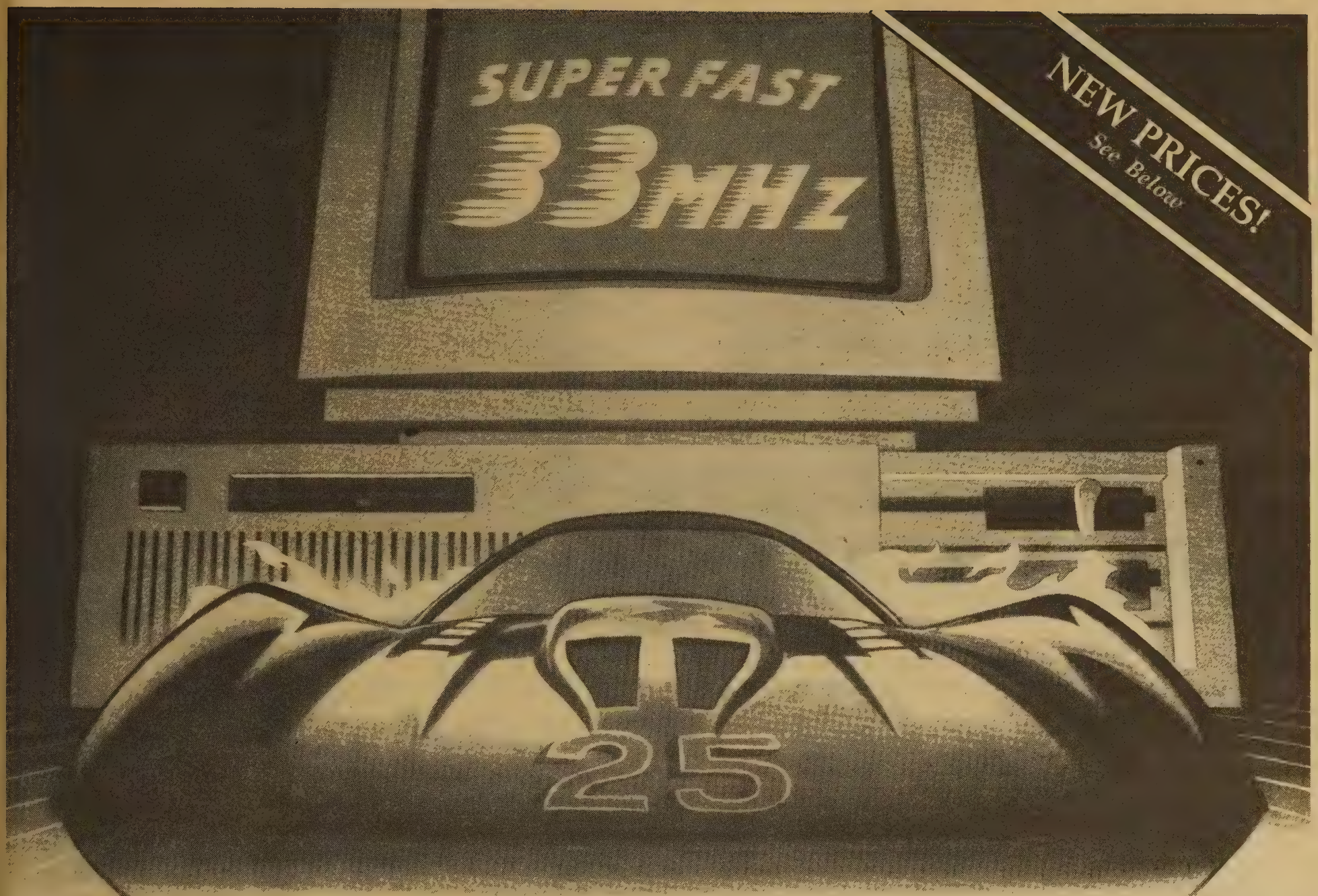

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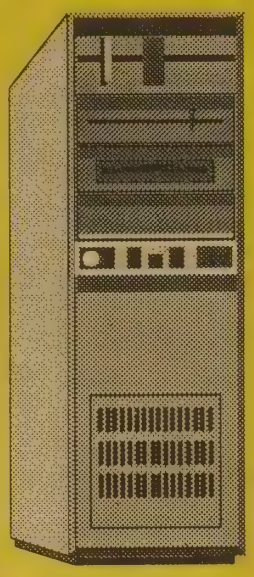

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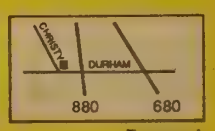

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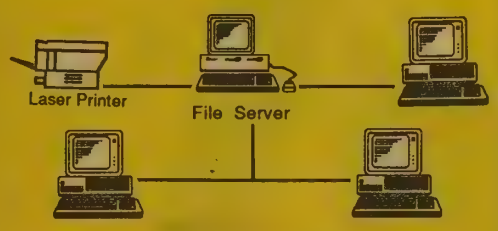

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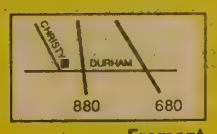

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Yesterday, Today, And Tomorrow

An Interview With Chairman And Co-founder Gordon Moore

By Mary Eisenhart • Photos By Michael Jay

"Intel: Architect of the Microcomputer Revolution," says the cover of the annual report.

In an industry that ingests its daily dose of hubris with its morning latte, this might seem like just another exercise in the grandiose. As it happens, though, it's more like the plain truth. Consider 1974's MITS Altair, the first personal computer, with the Intel 8080 at its heart. Consider the IBM PC and its innumerable clones, which firmly entrenched the 8086/8088 as a standard architecture. Consider the subsequent generations of the -86 family: the 80286, the increasingly ubiquitous 80386, the fast new 80486—all running the same software and presenting vistas of binary compatibility into the next century.

1989 was a banner year for Intel, and particularly for the 80386 chips. The low-cost 386SX appeared in machines by numerous vendors, making it possible for large numbers of people to migrate to the newer 32-bit architecture. Both MicroChannel and EISA machines using the chips came to market. Sun Microsystems continued to market its 386i workstation, and hardware companies such as NetFrame and Sequent began using both the 386 and the new 486 in new types of machines, sometimes featuring multiple processors. In a year with more than its fair share of ups and downs in the microcomputer industry, Intel is a clear winner.

Part of the reason for Intel's success has to do with its ability to spot emerging trends and position itself to take advantage of them. When Robert Noyce and Gordon Moore founded the company in 1968, they were already electronics industry veterans: they'd met while working for William Shockley, who co-invented the transistor, and had joined six others to found Fairchild Semiconductor. While at Fairchild, Noyce co-invented the integrated circuit, and Moore managed the R&D team in charge of bringing the first chips to market.

Intel's initial focus, at a time when computer memory was sold in the form of magnetic cores, was an attempt to develop a cost-effective way of putting it into silicon instead. By 1969, Intel was shipping its first

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SRAMs, and in 1970 its 1103 DRAM became a big hit in the mainframe marketplace, eventually driving magnetic-core memory into obsolescence.

1971 saw two significant developments at Intel: the first EPROM and the first microprocessor. Unlike previous programmable memories, which had to be discarded and replaced every time there was a code change, the EPROM could be erased with a beam of ultraviolet light and reprogrammed.

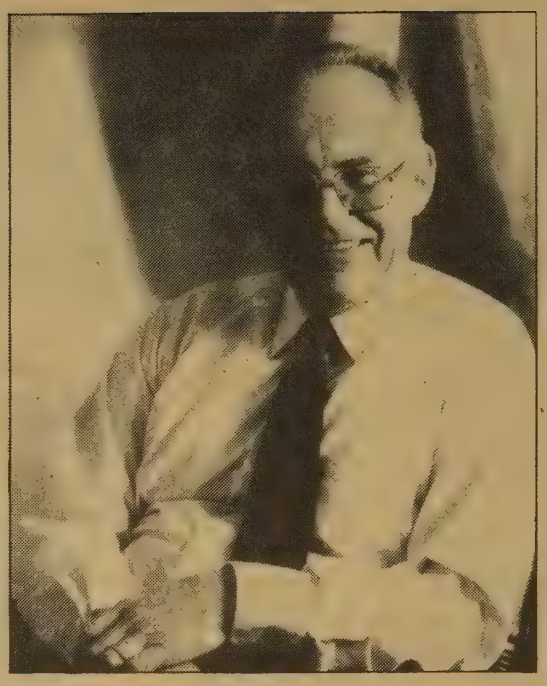
The microprocessor was the brainchild of Intel engineer Ted Hoff, who was assigned the project of designing a set of 12 custom chips for Busicom, a Japanese company that wanted to build a family of programmable calculators. Hoff decided that the 12-chip idea was unduly complex and instead developed a single-chip, general-purpose logic device which, in a world of custom chips, could be made to handle many different functions. Formally introduced at the end of 1971, the 4-bit 4004 was followed the next year by the 8-bit 8008. By 1974, the 8-bit 8080, offering roughly ten times the performance of the 8008, arrived and soon become an industry standard (as well as the processor of the Altair).

Aside from microprocessors, Intel's been successful with other products—for instance, the custom chips in every new Ford car and light truck made in America. There's a Systems Division in Oregon that makes peripherals and configures complete systems. And recently Intel acquired Digital Video Interactive (DVI) technology, which brings stereo sound and interactive full-motion video to personal computers.

It hasn't been all triumph for Intel. There was an ill-fated foray into the digital watch business in the '70s, a decision in 1985 to abandon the DRAM business (due to various factors, with the dumping of memory in the US by Japanese manufacturers among them), and, more recently, a certain amount of difficulty keeping inventories of the 386 chip in balance. Early this year, Intel came out on the losing end of a long-running lawsuit with NEC over the latter's 8086/8088-compatible processors, and it decided to abandon its BiiN joint venture with European giant Siemens, which had been intended as a development opportunity for mission-critical computers. Those troubles seem to be gone, however. The future's bright for the -86 family, and Intel's 860 RISC chip shows great promise.

Intel's founders continue to control its destiny and influence the industry's evolution. Last year, Noyce became CEO of Sematech, the manufacturing technology consortium for the semiconductor industry; he remains as Intel's vice-chairman. Andrew S. Grove, a Fairchild veteran who joined Intel at its founding, has been president since 1979 and CEO since 1987; he's also the author of numerous business and technology books and writes a weekly syndicated question-and-answer column called "Manager's Journal."

Chairman Gordon Moore still charts the course of the company he and Noyce founded 21 years ago. Engaging, and apparently quite free of the titanic ego often found among computer industry giants, he recently took some time with us to discuss where Intel's been and where it's going.



Gordon Moore: "We got into digital watches briefly. I still keep my $15 million watch here just to remind me, should we get an urge to go after product like that again."

Going back to ancient history for a moment, what was the impetus behind founding Intel? And has that changed much over the years?

Actually, the plan tracked it pretty well. Of course, it's beyond anything we planned now, but the original idea was that there was an opportunity in making very complex integrated circuits. The technology had gotten to the point where it looked like you could make these things, but it was hard to define any of them that weren't essentially unique—used once in a system.

We thought we saw in semiconductor memory the chance of making something quite complex and selling it to a broad range of applications so we could take advantage of this technology. It looked to us like a chance to change the leverage in the industry from having large assembly plants in Southeast Asia to being clever and processing the silicon.

That was the original opportunity we set out to pursue. Most of our first products were semiconductor memories. Then we were looking for more products that had this characteristic of being very complex, but ones we could make in fairly high volume so we could get the advantages of low-cost manufacturing.

And we ran across the microprocessor as another example of that. From then on, our emphasis switched gradually from memories to microprocessors, and the things related to them, to the point now where we're mostly microprocessors—we still make quite a few memories, but it's 10% or so of our total business.

We've evolved to make systems out of these things, and identified some other products with the same characteristics as those we went after initially as time went on. But I think, compared with most other startup companies, we went in an amazingly linear fashion from where we wanted to go to where we are now without too many side excursions.

We got into digital watches briefly (laughs and shows wristwatch). I still keep my $15 million watch here just to remind me, should we get an urge to go after product like that again.

What's the factor that causes you to get into a particular product area? What's the common denominator?

I suppose the common thread is still these complex functions on a piece of silicon that we can sell in large volume. That's gone through essentially all of our products. Increasingly we get driven by particular interesting opportunities in the marketplace, and we're still looking for more places where we can sell something in large volume.

Preferably where we're the *only* ones that are building it. (laughs). For example, DRAMs have changed quite a bit from the time we were initially in the business. At one time, DRAM was a very proprietary product for us—we were about the only ones making them; we were making very high margins on them. Gradually it got reduced to as close to a commodity as exists in the electronics business. That tends to be the general way these products evolve—they're proprietary for a while after their first creation, and eventually they approach commodity-type status. We've been more successful on the proprietary end than we have been competing in the commodity ends of the business, as much by our inclination as the disadvantages a US-based company has in competing in some of the commodities.

In light of that proprietary strategy—you have a RISC chip, the 860. As I understand it, it'll go against other RISC chips in the marketplace, SPARC and MIPS and some of the others. Now Sun has a diametrically opposed strategy—license SPARC to everybody, get a huge installed base so there's plenty of software, and thereby become the standard. How do you feel about that strategy compared to the one that worked so well for you?

Well, you have to look at it from the other point of view, in that we have several million of our -86 family already out there with the software lock. What Sun is trying to do with SPARC is somehow or other duplicate that, or get a portion of that. We got a very strong lock on architecture with that big software base.

The 860 was not designed to go out and compete directly with the SPARC, although it's capable of doing that if we got the software development going in that direction. It was designed principally to work with the -86 family, and add some of the very high performance computational capability into something that runs the software base we already have. We've got very good success in those kinds of applications, where there will be both processors in the same system. Though I'm sure several people will use the 860 as the main processor, we think most of the applications are going to use both processors. We feel that it's extend-

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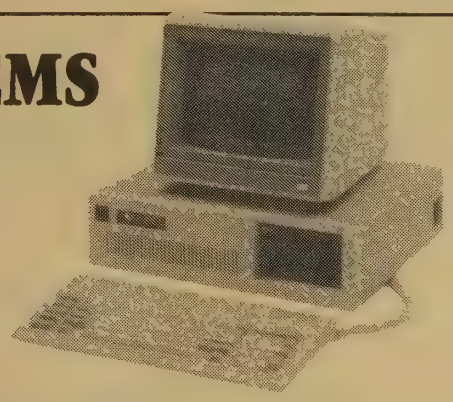

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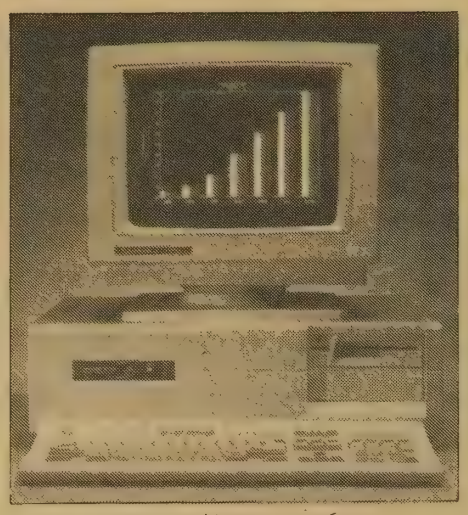

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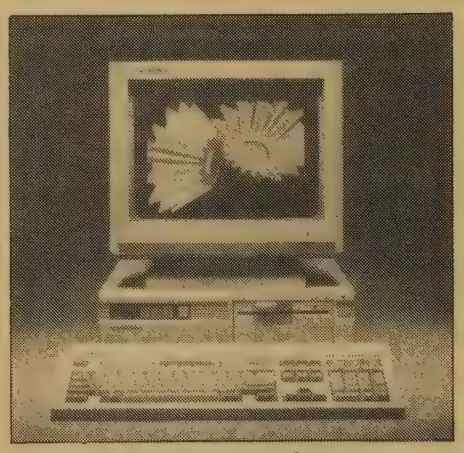

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g our existing family rather than starting a whole new competitive generation.

It sounds like you don't think there's really a RISC vs. CISC dichotomy, which is something some vendors make a big deal about.

No, I don't. I think it's really a fraudulent way of looking at it, almost. (laughs)

Could you elaborate on that a little?

Well, the people who were promoting RISC did a lot of interesting things in making high performance processors, but reducing the instruction set was the least important part. They did these pipelining ideas, for example. Well, we've incorporated all of those onto our 486, and have a machine that operates at very competitive speeds. So we don't think there is a significant performance disadvantage, if any, for CISC in the present generations, or in the next couple of generations.

Then some of the so-called RISC chips are getting instruction sets that are about as complex as any of the CISC, at least as many instructions.

We've gotten our average clock cycles per instruction on the 486, which is a CISC machine, as low as it is on most of the RISC chips out there, even the present generation. The 860 is a full one-instruction-per-clock by design, but we're at 1.4 average on the 486. It's not that big a difference. When it used to be five instructions per clock, we had quite a ways we could go, but we did that in this generation.

"At one time, DRAM was a very proprietary product for us—we were about the only ones making them; we were making very high margins on them. Gradually it got reduced to as close to a commodity as exists in the electronics business."

So I don't think there's that big a performance disadvantage. It depends on the kinds of things you want to do, which is probably better for your present application, which is more nearly a function of the software than it is of the hardware.

And right now there's not much application software that runs on RISC chips at all.

Not compared to what runs on the -86 architecture. Of course the other side of that is that DOS is an operating system that was built for 16-bit processors, and with the 386 and 486, it's essentially only using half of them.

Do you find that frustrating, that you're essentially two generations ahead of Microsoft?

Well, we wish we had some software coming along quicker, but we're not suffering badly from it. On the other end, of course, more UNIX runs on Intel processors than any other processors, which is a fairly well-kept secret. A large number of the 386-based machines that are sold are actually sold into UNIX applications.

There are a lot of them running Windows, but Windows is still a 16-bit operating system. So is OS/2. They were all written with the 286 in mind, and that's one place I wish Microsoft had started out with a different target—I wish they had targeted the 32-bit machines initially with OS/2 and Windows. But eventually I'm sure we'll get operating systems that do take advantage of it and still use the DOS software base.

But in the meantime UNIX does take full advantage of the machines, and in some of the benchmarks the 386 and 486 are blowing away some of these RISC chips with the optimized compilers and everything. Some of the preliminary results we've heard on 486-based machines running UNIX are really phenomenal.

What advantages does the 486 offer over the 386?

Principally, most people will see it as speed. With something like UNIX, it looks like a factor of three with the same clock speed. You don't get as big a factor with the DOS stuff, but you still get a factor of 1 1/2 or two, typically.

And that's due to software—DOS is just not up to handling 32-bit architecture?

That's right. As we move along further, the 486 is designed with multiprocessing in mind, so we'll get that. We'll get multiprocessing systems based on the 486. Compaq is already showing a dual-processor system. Sequent is using 386es in a multi-processor machine.

Did you anticipate the trend to multiprocessor machines using the 386?

Not as much, I guess. We didn't design any special multiprocessing features into the 386. We have added a couple of things in the 486 for that.

Another thing you get on the 486 is the on-chip floating point. Which,

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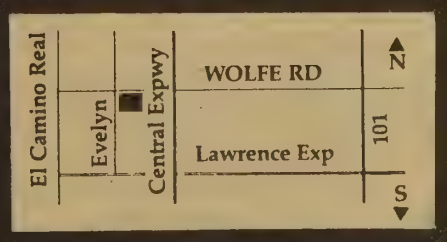

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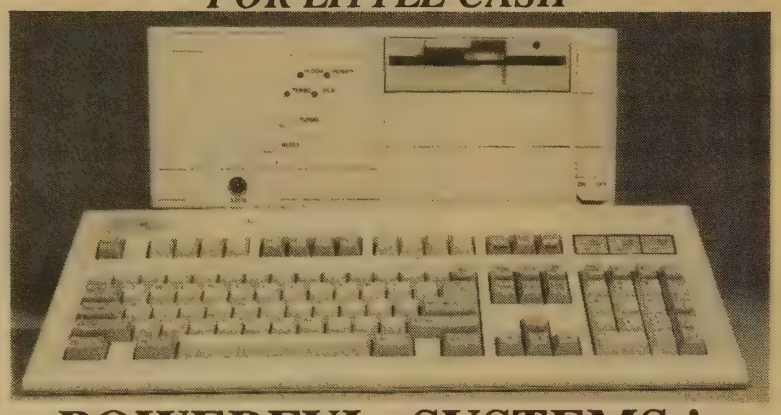

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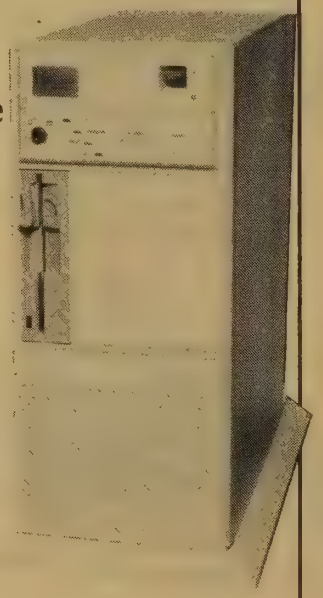

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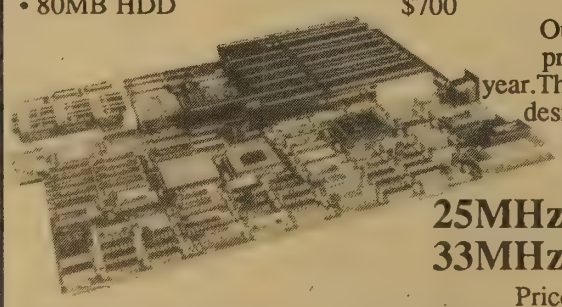

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first of all, means everybody with a 486 machine has high-speed floating point, and secondly it gives a significant speedup over the separate floating point chip. So you've got a powerful numeric machine even without adding on an 860 if you want.

The graphics capability on the 860 chip has been one of its major selling points. It's been designed in as a graphics accelerator in a number of places.

"DOS is an operating system that was built for 16-bit processors, and with the 386 and 486, it's essentially only using half of them."

About this billboard campaign. All over the place—over the Winchell's Donuts in my neighborhood—there appeared all these billboards with X-ed out "286," followed by new billboards for the 386SX. Not just in the Valley—in residential areas. This is a pretty different approach for Intel—what's the purpose of this campaign, and who's it aimed at?

It's aimed at trying to encourage this changeover to 32-bit processors. We really think that it's very limiting to have so much still dependent on the 16-bit world. And as long as a lot of 286-based machines are being sold, the applications tend to get written so they can run in either the 16-bit or the 32-bit environment. So nobody really takes advantage of the capability that's there.

We think that's going to hold back the development, so we are trying to push strongly the idea that if you are going to get a machine, you ought to move up to the 32-bit and get the momentum of the new software coming out for it. That's our motivation—we think it's the right thing to happen in the market, the right thing to happen for Intel, so the easiest place to push this along is by getting the end users to start moving to the 32-bit machines.

Have you had any feedback on how this has been received?

Oh, of course the people that have been promoting the program think it's been a fantastically successful deal. We have some anecdotal evidence on it—for example, the change to 32 bits in the US seems to be going at an accelerated rate recently, while it hasn't changed much in Europe, and we've been advertising in the US and not in Europe. We see nothing that suggests it's *not* having an effect, and you can point to several pieces of evidence that say it is, but how effective advertising is is something that's always difficult to measure.

You're in a very enviable position as the sole CPU source for a very widely cloned machine. Do you expect to continue to be in this position as time goes on? It seems that there's an increasing trend for vendors to become interdependent and form a lot of strategic alliances, and less room for loners.

Well, we certainly have strategic relationships with a lot of customers also.

Clearly we like being in a position where we can kind of control what's going on in the architecture. We think in fact that something like this is necessary to continue to afford the investments to keep advancing the systems. So we'll try to stay in this kind of position as long as we can. It's not something that you can necessarily expect to do forever—like I said in the beginning, I remember when the DRAM was every bit as proprietary as the 386 is today.

And today you can go into Fry's and get 'em out of bins...

(Laughs) We've seen one product after another go through that evolution, so it's naive to think that we can just sit here and the same kind of thing won't happen to the processors. Even if it doesn't happen to the 386, we have all the alternatives out there that we have to consider.

Do you see the -86 family going on forever, essentially?

Well, forever in my time-frame, at least. I think so. People are not going to want to abandon that massive amount of software. We've had to do a lot on the processors to carry that along—they all carry all of the scars, warts, whatever, of the old 86 and 286 in order to maintain the binary compatibility. But it's such an advantage for the user, I think we'll continue to do that.

As we make more and more complex chips, it's less and less a load from a percentage point of view, anyhow. You can build a 286 in the corner of the chip to handle those things, and still use most of the chip for whatever the important new functions are.

Intel and Bill Gates have had a relationship since the Altair, which obviously got a lot more intense with the advent of the IBM PC and Microsoft. What are the joys and sorrows of dealing with Microsoft at this level? You are VERY mutually interdependent.

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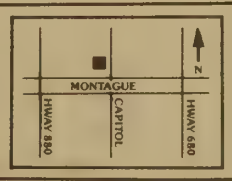

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panies with fairly strong opinions of where the world ought to go (laughs), so it leads to an interesting relationship that I think has evolved over several years. We disagree about a good number of things, agree on enough to keep our directions going generally together, and I think that's likely to continue to be the case.

I think it's a healthy relationship in the amount of skepticism we each bring to one another's view of the world. I don't know if we ever really succeed in convincing the other party (laughs) about our view of things, but there's enough common interest that we usually muddle our way through and, I think, come up with the right answers finally.

"More UNIX runs on Intel processors than any other processors, which is a fairly well-kept secret. A large number of the 386-based machines that are sold are sold into UNIX applications."

Is the 386 blitz campaign connected with Microsoft? Is Microsoft also interested in hastening the migration to the 32-bit architecture?

Not as much as we are. I think that's something that we have a stronger interest in. There we're a bit ahead of Microsoft in that they've spent a lot of time in the 16-bit things that's detracted from their ability to do the 32-bit ones at the same time.

Do you think 16-bit is essentially dead?

Not as dead as I'd like it to be. (laughs)

I'm not sure. I see something like this huge deluge of laptops that are becoming available. Initially, a lot of those are 286-based machines again. We'd like to also get those moved to the SX as soon as we possibly could, but I think that might even delay a bit the trend to 32 bits.

Does it get to be a hassle supporting so many generations of products?

It doesn't bother us so much, because having this binary compatibility we can supply essentially the whole range.

At this stage, the older chips are enough of a known factor that you don't get "Oh God, the 286 has a new bug!"

No. (laughs) Not that I know of, anyhow. There's a level of bugs that I never hear about.

Do you think OS/2 is going to be as successful as IBM and Microsoft would like it to be?

In fact, it could *never* be as successful as those two would like it to be (laughs). But I think the other side of this is that OS/2 absolutely will be a very important operating system. The exact time-frame I don't know. Whether it'll be one year sooner or later, I don't think, in the long run, makes an awful lot of difference. But it's had a tremendous amount of energy poured into it by two companies with a lot of clout—I think it's bound to happen.

There's not an especially good alternative, either. I think Windows is a very good intermediate step. The only other contender out there is UNIX these days. I'm not an expert in that area in the first place, but I am not inclined to think that UNIX is going to become every office computer's kind of operating system. It seems to be more nearly built for the expert than for the casual user.

(Laughs) But we would like to be the hardware it runs on, in any case.

In the MCA vs. EISA conflict, you have customers on both sides of the fence...

Again, we try to be independent of competitive standards. We like to support standards. Where there are two potential standards, we like to support both of them and really not pick sides. From our point of view, as a component supplier we remain as neutral as we can. We've tried to remain neutral on the alternatives of UNIX also for as long as we could—they're getting some consistent kind of binary interfaces, though, and if we can help set a standard we'll try.

But we have both the MCA and the EISA chipsets—we'll support either.

What's your relationship with companies like AMD and Chips and Technologies, who do various enhancements, improvisations, and the like on your chips? It seems like kind of a murky little area...

(Laughs) Well, it is. It doesn't have very well-defined borders.

In my view, if we did our job perfectly, there wouldn't be any need for most of those things to be done. The fact that Chips and Technologies built a very nice business supplying chipsets with our processors is an indication that we missed a marvelous market opportunity there that we shouldn't have. But on the other hand, now we benefit from the fact that they do supply these and make it

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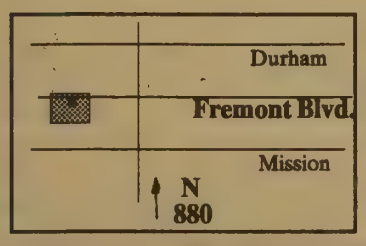

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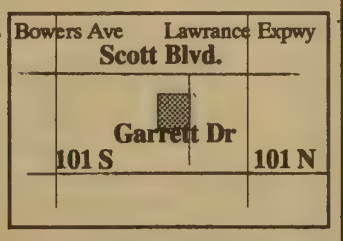

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In some cases we actually end up utilizing one of these other companies to make something for us. There's so many opportunities here—we don't begin to be big enough to do everything. Just trying to keep the processor moving as fast as it should in several directions really keeps a huge amount of our capability busy.

Recently you dissolved your BiiN alliance with Siemens. What's behind a decision like that? How do you know when something's not working?

I wish there were a general rule for that (laughs). I think every one has kind of its own life. That was a case where what we had bitten off was bigger than we had realized in the beginning, and the scope of the program just kept growing, and therefore the return on the program got pushed further and further out into time. It just was getting too big and too far out for it to make sense for us.

DVI is a substantial departure from anything you've done before. Where do you see that going, and what is your interest in it?

Well, (senior vice president) Dave House is the guy who probably had the greatest insight around here on that. He views the general kind of technology that DVI is pursuing as the future graphic technology for the desktop computer. And as such, an area that will be large-volume and will consume a tremendous amount of silicon.

"I wish Microsoft had targeted the 32-bit machines initially with OS/2 and Windows. But eventually I'm sure we'll get operating systems that do take advantage of it and still use the DOS software base."

So we had the opportunity here to pick up some technology that was reasonably well-developed; it seemed to have a leadership position in a direction that we thought was important in desktop computing, which is kind of the area we want to serve. That's the motivation behind it.

What we're doing now is taking the ideas they had and reducing them to high-integration silicon; get the cost down to the point where we can start putting it in PC-like products, and hope to get it accepted as a standard and then develop high-volume chip business around it. It kind of fits the same sort of thing, where we've identified an application and can use complex silicon in large quantities, and we go after it. It also integrates nicely with a view of where the PC is going, this whole multimedia thing.

How real do you think multimedia is? Some people think it's the wave of the future, and others think it's pretty stupid and useless.

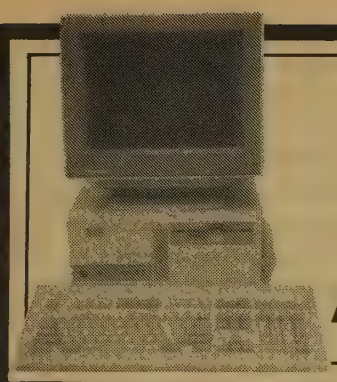
I can see some places where I think it's clearly going to fly. Some of the training applications, for example—you take the DVI and the video capability it gives, and you put the training manual for repairing a diesel engine, to give a very specific example, on there, where you have the ability to go in there, focus on any part you want; you can have the video there to show exactly how to remove something or put it back together, how to make an adjustment. As a prompt to the guy doing the servicing, or for training, I can't think of another technology that approaches it as well.

Then you can extend to the next series of applications, where they get a little shakier for me—the travel agent, who can show you a picture of a hotel, take you down the hall, show you what a room looks like, a video of the dance band (laughs) or whatever you want. You can give a lot of information about something like that. I think possibly that flies—it's not the way I would set up my travel reservations, but I can see the application there.

It frankly gets a lot fuzzier for me when somebody points to my computer and tells me I want it there. I don't know *what* I want to do with that capability here (points to desktop machine). I don't have a clear enough view of where this is going for everybody to really say it won't, but I can see some significant applications where I really think it'll fly. I think it's a worthwhile shot, and if it turns out to be a market only a tenth the size of what House thinks, it could be a pretty nice business for us. (laughs)

There's so many possibilities that somebody's going to hit on one that's going to prove very valuable, and it'll probably be one of the least likely ones, if I were guessing right now where it's going to have impact.

One application is training truck drivers, using it as a simulation system, where you've got the scenery going by and you can turn the steering wheel, and DVI takes you from one side of the road to the other. The kind of thing that they've done with the big



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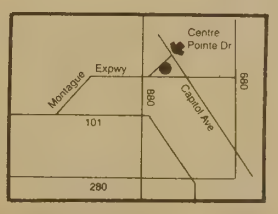

"We really think that it's very limiting to have so much still dependent on the 16-bit world. And as long as a lot of 286-based machines are being sold, the applications tend to get written so they can run in either the 16-bit or the 32-bit environment. So nobody really takes advantage of the capability that's there."

flight simulators for years, but reduced to a cost level where you can make all your truck drivers go through it once a year or so.

I think those kinds of things are very likely to fly. None of them individually is a compelling application, but collectively they could be pretty important, I think.

Does that have any implications as far as changing the course of hardware evolution? Is it going to require different kinds of processors?

Well, the DVI stuff is really high-speed video processing, so in that sense they really are different kinds of processors. But they integrate in with the rest of the systems that we're used to.

So conceivably you could have a 386 box with DVI running on it.

Right. A DVI card in every box—plug-in cards. You put on your compact disk and plug in your DVI card and you're in business.

And you've got a nice systems group in Oregon just waiting to build all this stuff...

(Laughs)

Which reminds me—considering that you were doing such a thriving business selling chips to computer manufacturers, what made you go into computer manufacturing yourselves?

I've had to explain this one more than once, as you might have guessed. (laughs)

To some of your customers, even...

We've actually been in the systems business since the early '70s. We got started with the old 1103, our first DRAM. The reason was, it was hard to use. A lot of the applications where we wanted to sell the thing, they just didn't have the engineering capability to design the memory system.

So we got to making memory cards and memory systems for these people who didn't want to do their own design. And we've carried that along—the microprocessors we had to do the same kind of thing with. You had to give development systems, software to go with them. And nobody got too concerned about those businesses. A lot of those applications were relatively small-volume, where the users didn't want to do the systems engineering themselves, so we could sell them at a higher level of integration.

So we developed the philosophy, "Okay, we'll sell you our things at any layer of integration you want—a component, a board, a box." Nobody was concerned about that until we said "Gee whiz, we're doing multibus systems, but there's this thing called the PC bus out there now that people are using more and more; maybe we ought to do PC bus systems." And when we started doing those at any level of integration, it ended up being a PC, when you got done with it at the box level.

But still we're an OEM supplier of these things, and there are customers out there who don't want to build their own boxes. Which is another argument. A lot of our classic customers, the Unisys and AT&Ts of the world for example, who used to be component customers for us, have stopped building much of their own stuff internally and want to buy finished hardware. So if we're going to continue to serve those customers, we kind of have to do it at the level they want. AT&T used to be our second-largest component customer; they're falling off on that end and picking it up on the box end.

So we're doing it for a couple of reasons. We're preserving our customer base, the same ones we've dealt with historically. And we're just continuing our historical view of offering our products at a variety of levels of integration.

I think it develops fairly easily logically. Emotionally, it can be a little more traumatic. Everything that looks like a forward step like that is going to bother somebody, I think.

That's kind of been the nature of the semiconductor industry ever since the invention of the integrated circuit. I remember trying to sell the first integrated circuits, and the people we dealt with in our customer base were principally circuit designers. So you would go into their engineering group and say, "Forget doing your own design of a flip-flop; we'll sell you a flip-flop." And they saw all of their value-added disappearing. It was traumatic until another Bob Noyce invention—he said, "Hey, we'll sell you the flip-flop for less than you can buy the components to build your own."

In fact, our industry has not really picked up the value-added. We've destroyed it. We've taken it on and given it back for nothing. And we went from there up to more and more complex functions—a logic design. You buy a processor now, and you've got the logic and everything done—you don't pay a premium over the way you used to build those things. We as an industry have gradually taken in some of this value and given it back free, and we're continuing to do that, I think.

"Do you think 16-bit is essentially dead?"

"Not as dead as I'd like it to be."

Do you see any particular threats or challenges facing the American chip industry in general, and Intel in particular? Sematech and US Memories were obviously founded to address some problems, but it's far from clear what they're going to be able to accomplish.

I think there are a lot of problems out there, and we are trying to find ways to tackle them. It's hard to get people's attention to the problems right now. Every developed country in the world except ours has recognized the importance of these industries and their future to the economy. And we're sitting here letting developing countries just decide which industries they want to take, focus in on it, and drive us out of it.

To me this is terribly destructive over a period of time. One after another, we let ourselves be driven out of businesses, the DRAM being the best example in the semiconductor area, where by overbuilding capacity, focusing on it, essentially the US industry was driven out of it. That just follows the consumer electronics industry. None of us ever get back into one of these businesses after we've been driven out.

I see that continuing to happen. Korea has announced a $39 billion program now to go after electronics, biotechnology—the leading industries of the future. The same kind of thing that Japan has done historically. And I see our government sitting here saying, "Oh, we can't support any one industry over the others..." What they don't seem to recognize is that by our taking a completely even-handed we-won't-help-anybody attitude, we sit here and let our trading partners pick off anything they want. I think that is a looming disaster that we can't seem to get the administration to get very excited about.

"We're sitting here letting developing countries just decide which industries they want to take, focus in on it, and drive us out of it. One after another, we let ourselves be driven out of businesses, the DRAM being the best example in the semiconductor area."

The industry keeps trying to find little places we can help—clearly we weren't as competitive in manufacturing as we should have been, so we tried Sematech, which is going to support the equipment industry to a significant extent, hopefully, so we won't lose that, or won't lose it as fast. US Memories was a response to our customers' desire—last year they were terribly beaten up in DRAM, the lack of availability, very high prices. We were a year late getting our program together. We finally come around with a program, and it's "Who needs DRAM?"

My view on that one is, it's our customers' problem, not our problem. I don't want to be back in the DRAM business, but we thought we were helping with something they wanted us to do. So if that doesn't fly, it'll only hurt us insofar as it makes our equipment suppliers less viable. But it won't bother Intel directly, except as a DRAM user.

And we'll keep looking for places where we can tackle this problem.

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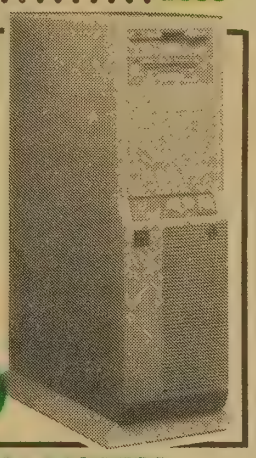

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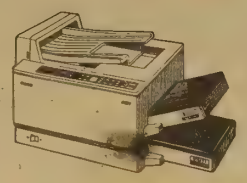

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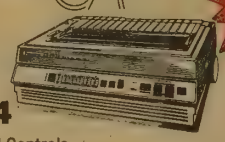

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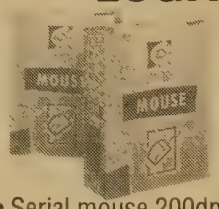

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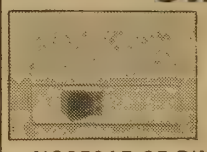

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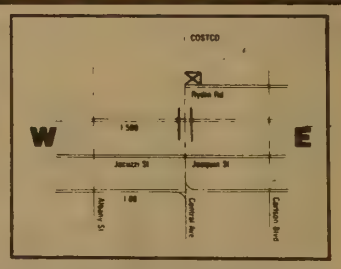

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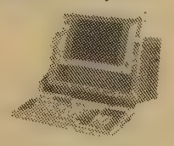

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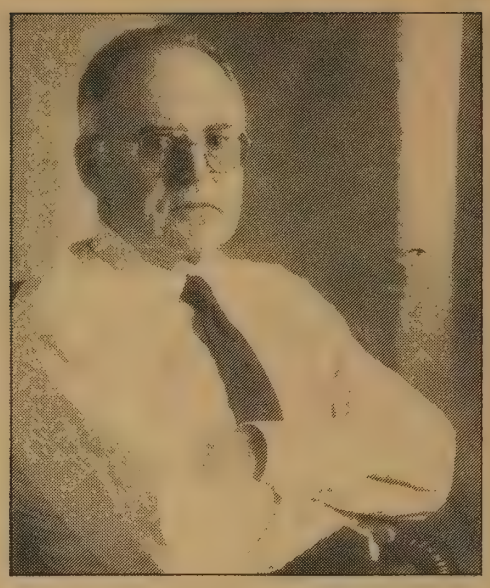

"Korea has announced a $39 billion program now to go after electronics, biotechnology—the leading industries of the future. The same kind of thing that Japan has done historically. And I see our government sitting here saying, 'Oh, we can't support any one industry over the others...'"

But I really am concerned about the ideology that seems to exist in the administration right now not to interfere with any of these trade patterns. If the world were a completely free place where everybody played by the same rules and nobody interfered, I think it'd be a very viable way to go. But instead of that we're sitting here as the only ones who aren't recognizing that these industries are important for our future. I don't think that's a very tenable position.

I was at a symposium on US-Japan trade a couple of months ago, where Mitch Kapor made a point that had to do with the US private sector rather than the government. He said that as compared to Japanese corporations, which take a very long view of things and plan for what's going to happen 50 years from now, the American business is far too obsessed with the quarterly profit and the short-term return. His contention was that Japan is going to eat our lunch for this reason alone. Do you agree?

I think there's a lot to be said for that. We are willing to live with less than a complete solution to our problems. The US has only been successful in developing new technology and exploiting it. It's very difficult to find an example where technology developed someplace else and we brought it back to the US and got a strong position. Maybe oxygen furnaces for steel might be an example contrary to that.

But I look at things now like—take the technologies necessary for laptop computers. We're in pretty good shape on the processors, I like to think, the silicon part, because it's something we developed and struggled with.

There's no display technology in the US. I don't know of a company that would be willing to jump into color liquid crystal displays and develop that starting at a disadvantage to the Japanese. I think we've just *given* them that.

Some of the very small peripherals, 2-inch disks and the like, seem to be developing in Japan, not here in the US. The microassembly technology, the kind of thing that's used in consumer products, your little video camera and whatever, is so appropriate to doing things like the laptop—that's a capability that doesn't really exist in the US.

I see something developing here, a very important part of the computer industry, where the only technology the US seems to have a significant advantage in is the processor and the software. Everything else is Japanese, and no chance of getting it back.

That's where I see a big discrepancy. The Japanese or the Koreans will try to pick up every aspect of the technology in an important product like that and bring it in-house, and will invest in it over long periods of time to get it. We will only take the ones where we have an advantage starting out, and we'll kind of gradually give up our advantage, and we'll never seem to make the investment to go back and pull it back in-house. So it's a problem. ■

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3rd The Annual MicroTimes 100

Our List Of Industry Leaders For 1989

SHELDON ADELSON
CEO and Chairman of the Board
The Interface Group

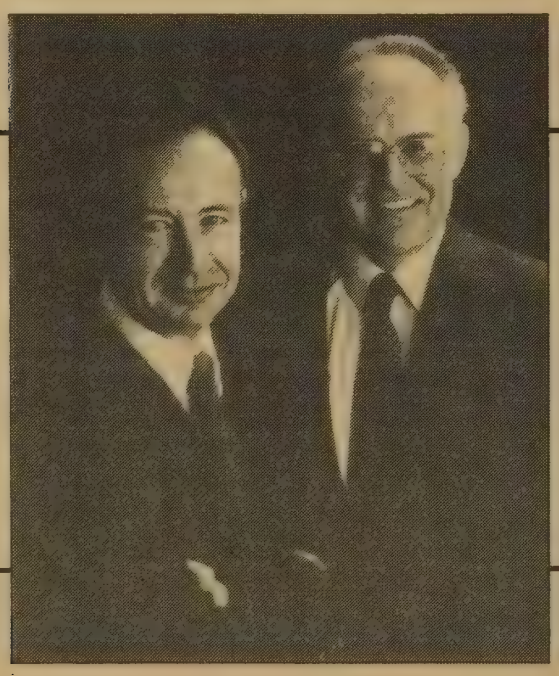
The industry leader in computer-oriented trade shows, Interface provides one of the chief forms of exposure for the industry, most notably with the COMDEX shows, the Fall version of which threatens to take over Las Vegas. It provides a showcase for vendors, dealers, and users to catch up on the latest in micros. 1989 saw dozens of Interface shows worldwide.

The fly in the Interface ointment, though, is the current sad state of the once-proud West Coast Computer Faire, which has degenerated to the appearance and excitement level of a low-grade swap meet. We join with the chorus of those who would urge Adelson to make the revitalization of this show a priority.

JOHN AKERS
Chairman of the Board, President, CEO
IBM

During 1989 IBM sold a slew of PS/2s (along with its midrange and mainframe hardware), including several new models, announced a new portable,

MEN OF THE YEAR



ANDREW S. GROVE
President and CEO
GORDON E. MOORE
Chairman of the Board
Intel

1989 was a turbulent year for the industry, with much upheaval, lots of innovation, and a good deal of strategic jockeying.

Nonetheless, if there was a clear winner, it was Intel. The 386 became ubiquitous in machines from laptops to parallel processing computers, the first 486-based machines shipped, and whether you wanted UNIX, DOS, or OS/2, MCA or EISA, there was an Intel-based machine for you.

After 20 years at Intel, Grove and Moore continue to direct its evolution. See our cover story this issue for an in-depth interview with Moore on Intel and its current and future technologies.

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and continued to push the standard of OS/2 while embracing other industry standards such as UNIX.

More than anything else, though, 1989 faced chairman Akers with a challenge beyond the short-term delivery of hardware and software. Its virtual monopoly on the corporate world, already challenged in the mainframe and micro arenas by companies like Amdahl and DEC, is being further challenged by contenders like Compaq, which has parlayed its successful PC-compatible business and early leadership in the 386 marketplace into an impressive performance with its network server and EISA-bus machines. And at year's end, Akers was responding aggressively to make IBM a lean, mean fighting machine in an attempt to reduce costs (and hence consumer prices) and improve performance. As IBM faces the prospect of staying ahead in a market it no longer fully controls, Akers has shown the willingness and ability to adapt to change and turn around lagging performance.

CARLTON G. AMDAHL
Chairman

ENZO TORRESI
President and CEO

NetFRAME Systems

On the face of it, the launch of a radically new type of computer designed to support the unique needs of networks seems like a pretty risky venture, but after all, according to market research firm Infonetics, by 1992 more than half of all PCs and workstations will be connected via local area networks. Mindful of this upcoming opportunity, Amdahl and Businessland co-founder Torresi joined forces and secured financial backing from a diverse range of supporters including Xerox Corporation, Apple Computer, Olivetti, Chips and Technologies, and Kleiner Perkins Caufield and Byers.

Carlton G. Amdahl

The result was a series of 80386- and 80486-based network servers, small boxes with mainframe-class throughput. Which gave Amdahl the opportunity to deliver what was, in our opinion, the best line spoken at a press conference all year.

After a great deal of the usual hooha, with fog machines and everything, Amdahl got up to explain the history of networks, mainframes, and how it all fit. He meandered through the early history of IBM, making liberal mention of the achievements of his father Gene Amdahl, one of the chief architects of IBM's mainframe technology, who eventually left to found his own IBM-compatible mainframe company. Winding up his oration, the younger Amdahl prepared to whisk the veil off his latest creation.

"Daddy," said he, "I shrunk the mainframe."

ALAN ASHTON
President

WordPerfect

The undisputed leader in corporate word processing, WordPerfect is also the only software company to have its product available on all significant microcomputer platforms (including Atari and Amiga) as well as UNIX. It must be doing something right—it recently overtook Ashton-Tate to become the third-largest in personal computer software sales, behind Microsoft and Lotus.

During 1989 it continued to improve and enhance not only its DOS product, WordPerfect 5.0 (which also fared very well in our recent writers' poll), but its versions for other machines as well. The company also scored points among users for its responsiveness to customers, both in its telephone support lines and in its receptiveness to feature requests.

Apparently WordPerfect has now attained a sufficient degree of prosperity that founder and Brigham Young professor Ashton moved his family of 11 children out of the tract house they shared with relatives into their own place. We wish them all the best.

DANIEL BEN-HORIN
Director

CompuMentor

A few years ago, Ben-Horin founded CompuMentor to bring together the computer-literate and the nonprofit organizations that could benefit from their expertise. In 1989 CompuMentor performed hundreds of such matches, and is currently making an informational starter kit available to people around the US who'd like to start similar programs in their area.

MIKE BOICH
President and CEO

Radius

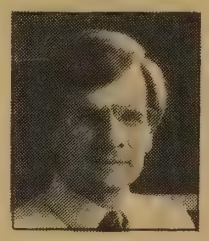
Under Boich's leadership, Radius is constantly pushing the Macintosh technological envelope, particularly in the areas of color display and output. During 1989 it announced such revolutionary developments as the QuickCAD graphics engine, a RISC-based board that accelerates graphics operations, and a joint project with Pantone, the Pantone Color Resource and Precision Color Calibrator, which brings true what-you-see-is-what-you get color to the Macintosh.

The world being a multi-vendor place, Radius also announced its first PC display systems.

PAUL BRAINERD
President and CEO

Aldus

Brainerd essentially invented the concept of desktop publishing, and his company remains the leader in that technology. Its flagship product, PageMaker, was further enhanced for better color-handling capability, and FreeHand 2.0 shipped during 1989.



Additionally, Aldus diversified somewhat into the area of desktop presentations, shipping Persuasion, a slide-and-handout-creation package that's so simple even an executive can use it...

DAVID BUNNELL
Founder

Io Publishing

Advisor

Computers And You

Although Bunnell's announced magazine for the NeXT seems to have receded into the mists of vapor, he launched yet another publication this year, *BioWorld*. There's a difference, though; *BioWorld*, which covers the biotechnology field, is published online, on the CONNECT service.

On another front, we're particularly pleased to honor Bunnell for his work (along with the Rev. Cecil Williams of San Francisco's Glide Memorial Church) in founding and supporting Computers And You, a program which trains children, students, and adults in computer skills. Located in San Francisco's Tenderloin, C&Y offers resources and a way out of poverty to the homeless and others with few conventional opportunities.

JIM BUTTON
President

Association of Shareware Professionals

Button, whose own company Buttonware exemplifies the values of a good shareware organization, leads an organization which not only supports and promotes the notion of shareware, but also offers help to users of shareware products and advice to would-be shareware vendors. For many users, individual and corporate alike, shareware offers a valuable alternative to conventional publishing and allows the availability of quality products at low cost.

BILL CAMPBELL
President and CEO

Claris

Last year it seemed a little uncertain what Claris would manage to achieve as an Apple spinoff given the task of modernizing and marketing Apple's aging software line. However, in the intervening time Campbell has not only pulled together a solid, competitive company, he's positioned it effectively as a vendor of Macintosh and Apple II software calculated to address the needs of the majority of users. 1989 saw the shipment of the much-enhanced MacWrite II with, at year's end, the most extensive collection of file format converters for other Mac and PC applications available. Claris also acquired FileMaker 4 from Nashoba and re-released it as FileMaker II, the leading flat-file database in the Mac world. Claris has also shown some much-needed leadership in enhancing the way its products work together and has committed to even more connectivity in the future.

GORDON CAMPBELL
President, CEO, Chairman of the Board

Chips and Technologies

Campbell is one of the leading voices in the chip industry and directs his company in the creation of silicon-based enhancements for DOS, OS/2, and other systems, as well as the identification and development of emerging markets. One such venture came to light this year, as Chips and Technologies was a major investor in the NetFRAME technology, a radically enhanced network server architecture based on Intel's 386 and 486.

JOSEPH R. (ROD) CANION
President and CEO

Compaq

Perhaps the biggest Compaq headlines this year had to do with the company, an aggressive promoter of the EISA standard, parting ways with systems integrator Businessland, historically one of its best customers, because Businessland supported IBM's rival Micro Channel bus. Since Businessland accounted for about 7% of Compaq's sales, this was a bold move on Compaq's part.

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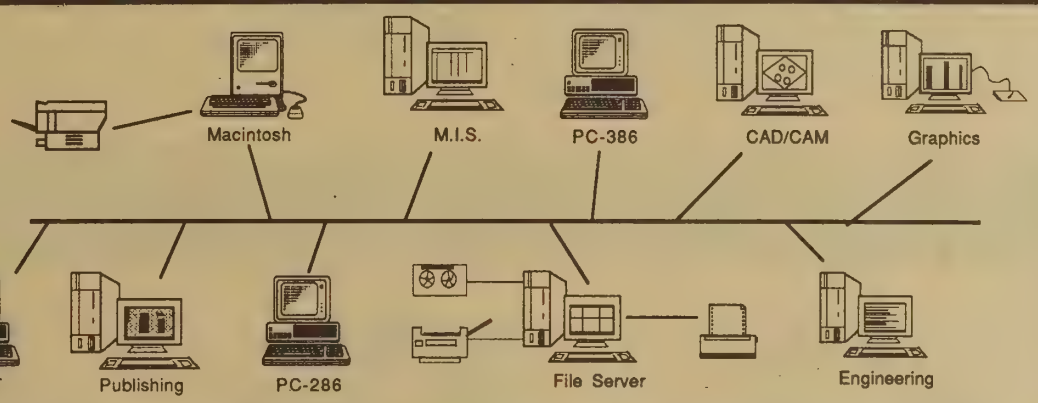

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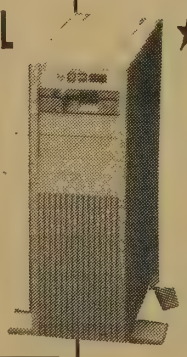

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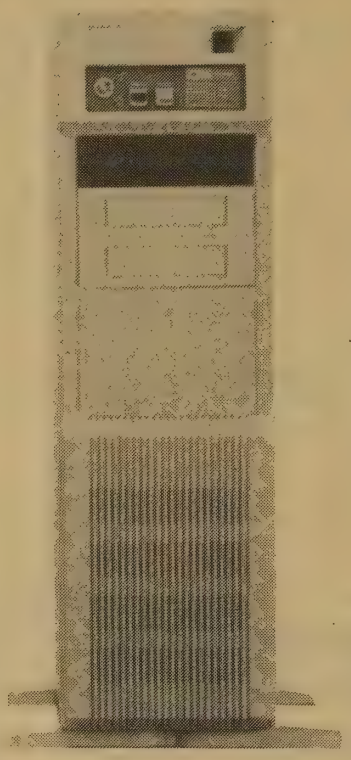

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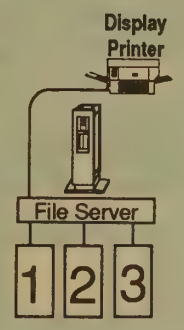

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It doesn't seem to have hurt Compaq a bit, and indeed the company seems to be challenging IBM's hegemony on a number of fronts, having shipped EISA-based machines, a new line of network servers, newer and better portables, and new computers based on Intel's 80486 chip. Under Canion's leadership, the company is rapidly mutating from successful PC-compatible vendor to an innovator.

MARC CANTER
Founder and Chairman of the Board

JOHN SCULL
President

MacroMind

This has been a year of big changes for MacroMind. Canter, realizing that the multimedia revolution was upon us and that his bestselling VideoWorks had to be positioned to take advantage of it, moved MacroMind from Chicago to San Francisco (the better to be close to Apple), picked up some new venture capital, and recruited desktop publishing maven John Scull from Apple to assume the company's presidency.

Marc Canter

The first fruit of all this change was the release of MacroMind Director, an enhanced next-generation version of VideoWorks that brings sophisticated video, animation, graphics, and sound capability within the reach of the unsophisticated as well as the professional user.

DOUG, GARY, CATHY CARLSTON
Brøderbund

True, these folks would probably have a nice business just maintaining and upgrading The Print Shop, Brøderbund's perennial bestseller. However, they don't—each year brings a new crop of educational and entertainment packages that America takes to its heart. This year's crop includes the latest in the Carmen Sandiego series (created because of the Carlstons' childhood fondness for looking things up in almanacs), Where In Time Is Carmen Sandiego?, and a lavish color adventure extravaganza, Prince of Persia.

There's more to Brøderbund than fun and games, though. At year's end, the company shipped TypeStyler, a font manipulation package. And its Sense series has made the inscrutable elements of math accessible to thousands of formerly frustrated students.

FRANK CAUFIELD, BROOK H. BYERS, L. JOHN DOERR, THOMAS J. PERKINS, VINOD KHOSLA, E. FLOYD KVAMME, JAMES P. LALLY, REGIS MCKENNA
General Partners

Kleiner Perkins Caufield and Byers

With its phenomenal track record (Lotus, Sun, Compaq, etc.) and the individual expertise of its partners, KPCB is among the most influential forces shaping the industry. In keeping with its *zaibatsu* philosophy, it announced a host of alliances between its member companies, including Lotus/Sun and Lotus/Sybase. It's also supported new ventures such as Dynabook, Agilis, and NetFRAME, which announced innovative products this year.

KPCB is also active in the biotechnology arena, so maybe we should look for an artificial intelligence board from Genentech one of these days...

JIM CLARK
Chairman of the Board

ED MCCRACKEN
President and CEO

Silicon Graphics

Clark and McCracken founded and direct a company that pioneered 3D workstation technology and is now dedicated to making it at once more powerful and more affordable. 1989 saw volume shipments of its under-$20,000 RISC-based Personal Iris workstations, revolutionary not only for their price-performance ratio (which improved as the year went on and prices were further reduced) but for their remarkable ease of use and maintenance.

The Personal Iris may well be the first commercial product to have reduced a BMUG audience to awed silence, a phenomenon witnessed by at least three *MicroTimes* writers simultaneously. We think that probably deserves some kind of award all by itself.

RAINES COHEN, STEVE COSTA, ET AL.
BMUG

For another great year of stalwart service to the Mac user community, constructive terrorization of the Mac vendor community, and the general good taste to know cool stuff when they see it and cut through the hype when they don't, we salute BMUG, a major force for good in the computer universe.

NEIL COLVIN
Chairman of the Board and Chief Scientist

Phoenix Technologies Ltd.

This year Colvin launched a search for a president and CEO for the company he founded ten years ago, finally recruiting 21-year industry veteran Ron Fisher, with a strong background in UNIX and PC software.

While a company that owns as much of the Intel universe as Phoenix is in an enviable position—after all, it manufactures and sells the ROM BIOS Plus at the heart of XT and AT systems, the EISA ROM BIOS and the Advanced ROM BIOS used in PS/2s—it reported a loss in 1989, mostly due to restructuring and streamlining some of its operations to focus on its proven markets. One casualty—as other vendors rushed to embrace Sun's SPARC technology, Phoenix decided to abandon its SPARC porting initiative. The company expects to be profitable again by mid-year.

HAROLD COPPERMAN
President and COO

Commodore Business Machines

Arriving in April, Copperman, a veteran of both Apple and IBM, has moved aggressively to set Commodore's chaotic house in order. He recruited a new management team, including fellow Apple alumnus C. Lloyd Mahaffey as VP of marketing.

In September Copperman announced a major reseller agreement with Connecting Point of America for the company's Amiga and PC lines. And the Christmas season saw what was probably the most aggressive advertising blitz in the company's history, with luminaries like Tip O'Neill, Tommy Lasorda, the Pointer Sisters, and the occasional astronaut singing the praises of the versatile Amiga.

Will this strategy pay off? Will Copperman survive Commodore's apparent Curse of the Short-Tenured President? Will the Amiga attain what its users have been saying all along is its rightful place in the universe?

Stay tuned.

LES CRANE
Chairman of the Board, CEO, and Founder

The Software Toolworks

Former TV celebrity Crane has been slowly building his software house for the last few years with products aimed at the consumer market, including the well-regarded Chessmaster 2000, Mavis Beacon Teaches Typing, and Life & Death, to say nothing of the ever-popular printing utility Twist & Shout. However, the company's apparently really on the move these days.

In July the company held a public stock offering to raise funds for working capital, research and development, and potential acquisitions. And in November, the company joined forces with Headstart Technologies, a division of North American Philips, which manufactures user-friendly DOS machines with a proprietary interface. Under the terms of the agreement, The Software Toolworks becomes the exclusive developer of environments and operating system enhancements for the Head-Start computer line for the next two years.

At year's end, Crane announced the acquisition of long-time game and educational software developer Mindscape.

JOHN C. DVORAK
Columnist

1989 was a banner year for Dvorak's personal brand of consumer advocacy and high-tech hell-raising, with incompetent computer salesmen emerging as a favorite target. Not content with this, however, Dvorak teamed up with writer Nick Anis to produce a gigantic info-and-software combination, *Dvorak's Guide to PC Telecommunications*, which offers descriptions of online services and information on how to access them, as well as some of Dvorak's personal favorites in PC shareware programs.

STEVE EDELMAN
Chairman of the Board and Chief Scientist

SuperMac

Now that he's re-acquired the company he founded from Scientific Micro Technology, whose underfunded state was sending SuperMac into oblivion, Edelman has lost no time in getting it back on track. In addition to its high-quality storage devices and best-selling large monitors and video cards, SuperMac broke new ground this year by releasing a host of true-color (24-32 bit technology capable of displaying photo-quality and better color) products, from an enhanced version of the PixelPaint software to a series of relatively low-cost 24-bit color cards. As Macintosh brings full-color applicatons into common use, SuperMac is positioned as a

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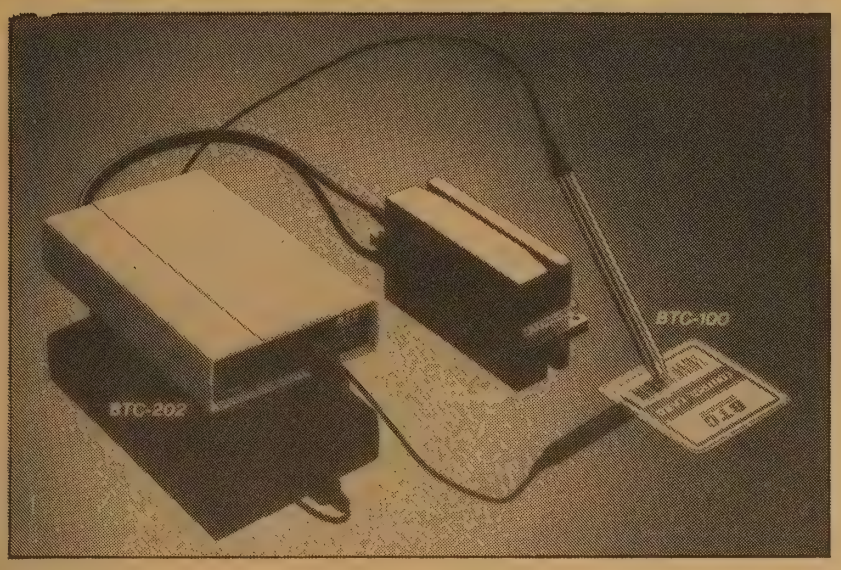

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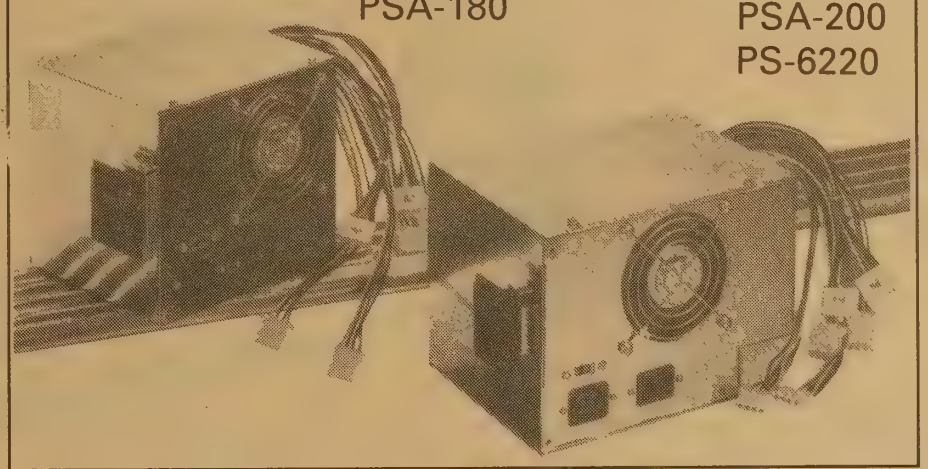

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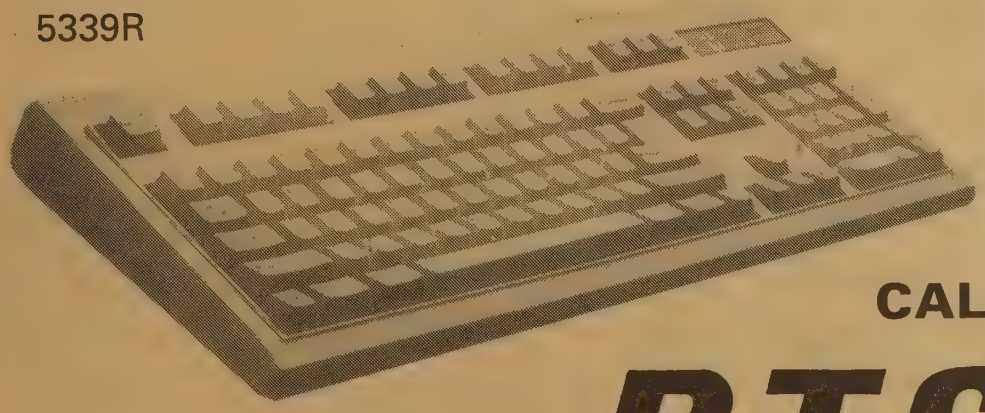

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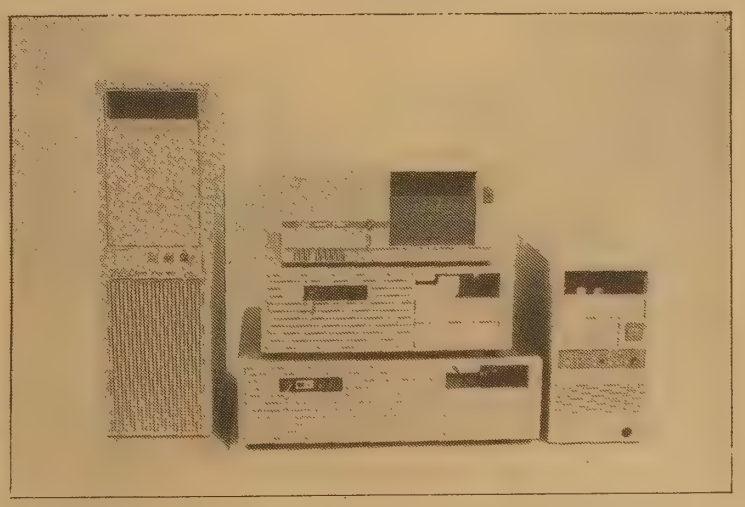

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JOHN ELLENBY
Chairman of the Board, CEO, and President

KEN BIBA
COO

Agilis

GRiD founder Ellenby and network pioneer Biba joined forces to create Agilis, on the principle that portable computing is all very well, but it's not much good if you're trying to operate under hardware-hostile conditions like factory floors or forest fires or thunderstorms. Perceiving that quite a lot of computing needs to be done in adverse environments, Ellenby and Biba devised the Agilis system, which allows the user to configure modular XT or 80386 portable systems and have them communicate over wireless networks. Like Ellenby's original GRiD portables for the military, these systems aren't cheap, but they run standard software and they make computing possible in environments that annihilate lesser machines.

LARRY ELLISON
President and CEO

Oracle

How many more years can Oracle go on doubling its annual revenues? Probably indefinitely, according to founder Ellison, who pioneered relational database technology and has made it a matter of policy to port the software to any hardware environment that makes sense for it.

The third-largest independent software company in the world, Oracle has long dominated the world of large computers. As microcomputer vendors become more connectivity-conscious and powerful networks become more prevalent, Oracle is now making significant inroads there, enabling PC terminals to access mainframes running Oracle in a transparent manner.

A fan of the Mac, Ellison is proud of this year's release of Oracle for Macintosh, a HyperCard-based approach to Oracle.

MARK EPPLEY
Chairman of the Board and Founder

Traveling Software

Eppley founded Traveling Software in 1982 to design and develop what he termed "accessibility" products for moving information between desktop and portable computers. As laptop computers become even more popular, LapLink and other products are mainstays of both the DOS and Mac worlds.

However, computers keep getting smaller, and Traveling Software is ready—with products for moving files between a Sharp Wizard and either a PC or Mac, or between a PC and the Casio B.O.S.S.

ED ESBER
Chairman of the Board and CEO

Ashton-Tate

"We are endeavoring," Esber wrote in Ashton-Tate's annual report last spring, "to build a large and successful applications software company that develops and offers standalone and workgroup applications tools which help a diverse set of end users. We can accomplish this by providing our customers with a means to create productive computing environments without the help of a professional programmer."

Well, Esber's path has been strewn with more than its fair allotment of trouble this year. Delays and bugs plagued dBASE IV, the latest version of its flagship product. Ashton-Tate was in the courts with Fox Software (whose FoxBASE product was making significant gains in the DOS and Mac worlds, and who promptly countersued).

WordPerfect overtook it as the third-largest microcomputer software company. President and COO Luther Nussbaum departed midyear amid a good deal of acrimony.

Still, if Esber can transcend these difficulties, he has Ashton-Tate well positioned for the future. dBASE is likely to remain the industry standard into the indefinite future; SQL-Server, A-T's joint project with Sybase and Microsoft, will be at the heart of OS/2 network technology.

Perhaps just as important for the long term, Esber moved all the company's Macintosh and non-database PC development to a new office in San Jose. At the Northern California Product Center, Scott Wiener and a crew of interface artists are hard at work on a new generation of products, expanding the groupware capabilities implicit in the early products. As for the Mac products serving as a foundation for OS/2 and UNIX products, Wiener grins in a distinctly affirmative manner.

GORDON EUBANKS
President and CEO

Symantec Corporation

Longtime Symantec chief Eubanks was able to take his company public last year; it had its initial stock offering in June. It was otherwise a good year for Symantec, too—Macintosh users everywhere blessed the company for the S.U.M. and S.A.M Utilities, chief protectors against disk crash and virus invasions. Additionally, the best-selling and award-winning Q&A database program came out in an OS/2 version, the personal information manager GrandView garnered praise and awards, and the latest version of the Time Line project manager was enthusiastically received. As OS/2 becomes more predominant, Symantec is committed to a significant presence in the groupware environment.

DAN FARBER
Executive Editor

MacWeek

Nobody, least of all Apple, knows how *MacWeek* manages to find out all these things it's not supposed to know about. However, in addition to its usual timely information on Macintosh products and happenings, *MacWeek* spent the early part of 1989 gleefully disclosing lavish—and substantially accurate—information about all of Apple's CPUs for the year. Apple gnashed its teeth early and often. Mac information guerrillas rejoiced. Machine sales seem to be unaffected.

CLIFFORD FIGALLO
Director

The WELL

What's arguably the world's most interesting conferencing system attained some important milestones this year, as it left its creaking VAX behind and moved to a newer, faster Sequent computer. By year's end, the increased levels of traffic as new and old users discovered and explored the system were driving the WELL to the frequent addition of new phone ports.

In addition to its usual debates, soap operas, and helpful discussions, the WELL attained national prominence in October as a communications center after the earthquake. The first-hand reports of Wellbeings appeared in *The Wall Street Journal* and other publications as readers around the country sought information about post-disaster conditions.

JOHN P. FRANK
President

Zenith Data Systems

Zenith had another banner year in its computer operation, shipping lots of portables and introducing its contender in the tiny computer class, the Zenith MiniSport.

At year's end, however, the Zenith parent company had decided to get out of the computer business, citing the increasing complexity of competition in global markets, and was in the process of selling its Computer Group, which includes Zenith Data Systems, to French giant Bull. If stockholders approve the sale, Frank will assume broader responsibilities, becoming president and chief operating officer of the new Zenith/Bull entity.

JOHN FRY, DAVID FRY, RANDY FRY, KATHRYN KOLDER
Fry's Electronics

Both locations of America's premiere electronics supermarket survived the quake unscathed, and continued to draw thousands of shoppers to check out a seemingly infinite variety of high-tech gear. The publicity-shy Fry Brothers categorically deny last year's rumors about John Fry's software package and generally don't want to hear any more rumors.

Kolder, who's active in the day-to-day management of the stores, also serves on the advisory board of our sister publication, Western MicroMarket, which addresses the dealer/VAR marketplace.

DAVID FULTON
President and Co-Founder

Fox Software

Fox, which made its first inroads into the database market by marketing its FoxBASE application for XENIX systems through the Santa Cruz Operation, has been an increasingly strong contender in the Mac and PC arenas recently, finding ready acceptance among users frustrated by delays and bugs in dBASE and attracted by Fox's power and connectivity. Fox is also moving into the network world, having signed an agreement with Novell to co-develop FoxServer.

Fox and Ashton-Tate are currently in the courts—each claims improper use of the other's code.

WILLIAM H. GATES
Chairman of the Board and CEO

Microsoft

There was rejoicing in Redmond as Judge William Schwartzer dismissed most of Apple's look-and-feel suit against Microsoft and Hewlett-Packard,

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and by year's end Microsoft had confounded Adobe and amazed observers by announcing an agreement to develop a new rival Macintosh font technology—with Apple.

As the publisher of operating systems for most current hardware platforms and the emergent ones, to say nothing of some of the most successful applications in the industry, Microsoft is the undisputed leader of the personal computer software business, a position it's likely to maintain with the coming-of-age of OS/2, Presentation Manager, and SQL-Server, its network server.

Gates remains one of the most outspoken, oft-quoted, and influential figures in the industry, and his sense of its direction has enabled Microsoft to stay on top for its entire existence.

FRED GIBBONS

President and CEO

Software Publishing Corporation

A Hewlett-Packard veteran, Gibbons founded Software Publishing Corporation to deliver highly functional, easily learned, and simple to use tools for the first-time computer users coming along with the advent of the first personal computers. While it's never abandoned the new user, SPC has expanded that principle into a broad base of powerful tools for the business and professional user. It currently publishes five of the leading applications in the MS-DOS world: Harvard Graphics, Professional Write, Professional File, PFS: First Choice, and PFS: First Publisher.

ALVAR J. GREEN

Chairman of the Board, President, CEO, CFO

Autodesk

Autodesk's annual report opens with a quote from Volpe & Covington Investment Analyst William Edwards to the effect that "Autodesk isn't growing as fast as it was in the beginning. But if it was it would have exceeded the Gross National Product by now." (An Autodesk footnote punctiliously notes that, strictly speaking, that wouldn't happen till 1992.)

If anybody was worried about what would happen to Autodesk when co-founder, chairman, and president John Walker decided to go back to programming and handed the reins to longtime Autodesk veteran Green, they needn't have been. Once again in 1989, Autodesk showed impressive increases in revenues and earnings and maintained its position as the undisputed leader of CAD software for PCs and workstations. It also shipped the first version of AutoCAD for the Macintosh.

Not resting on AutoCAD's laurels, however, the company is engaging in extensive research and development in new technologies, including the Xanadu hypertext system and the Cyberspace virtual reality project. It also shipped two innovative and non-AutoCAD products—Autodesk Animator, quickly hailed as the best animation package for the PC, and Rudy Rucker's CA Lab, software for creating and exploring artificial life.

GEORGE HARA

Founder and CEO

Data Control Limited

As founder and CEO of a US/Japan system software and network company, and managing director of DEFTA, a venture capital fund, and one of the directors of The Wollongong Group, Hara is a leader in the field of US/Japan high-tech ventures and the creator of the "Multinational High Technology Start-Up" concept. His company, DEFTA, sponsored the Alliance Japan conference last year in San Francisco and will be presenting the Alliance '90 conference in Tokyo at the end of this month to explore opportunities for win-win situations in US/Japan technology.

KIICHI HATAYA

President

Toshiba America Information Systems

This year, as sales of Toshiba portables and peripherals continued to do well, Hataya implemented some long-range decisions to position the company well for the future and to make it a truly American child of its Japanese parent. Most notably, in an effort to enable the company to respond more rapidly to the needs of its US customers, Toshiba broke ground for a new printed circuit board plant in Irvine, which is expected to open in April and create 60 new jobs. While the plant will eventually make boards for cellular phones, fax machines, and copiers, the initial priority will be boards for portable computers—said Hataya, "An important part of the decision was our commitment to eventually classify our laptop personal computers as 'Made in the USA.'"

The company also expanded its manufacture of telecommunication equipment in Irvine, and Hataya created a new division specifically to handle the operations of its growing fax division.

JEFF HAWKINS

Director of Advanced Programs

GRiD Systems

We love it when people tell us about people like Hawkins. In this case, it was his colleague at GRiD, Rion Cassidy, who wrote, "Jeff is the man who conceived and designed the GRiDPAD, GRiD's new hand-held that is perhaps the first real notebook computer. The GRiDPAD can act like an electronic form and recognizes people's printed characters as they mark them on the screen. Jeff conceived and implemented the algorithm for the handwriting recognition, as well as overseeing the entire project from hardware and software perspectives. *BYTE* magazine recently said, "In a year of innovative portable computes, the GRiDPAD is the most innovative of the group. It's perhaps the most revolutionary computer of any kind since the Macintosh."

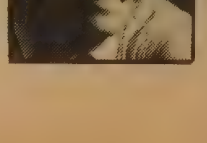
We knew that any computer that lets you handwrite input is a great technological breakthrough, but we didn't know exactly who was responsible. So thanks, Rion.

TRIP HAWKINS

President

Electronic Arts

The man who introduced the "simple, hot, and deep" concept to the software industry can point to some excellent implementations of the principle among his company's offerings this year. The Battlehawks 1942 game from Lucasfilm was a big favorite, and on the graphics side, the latest version of Dan Silva's Deluxe Paint delighted Amiga users. Mac users were wowed by Studio 1, a black-and-white graphics program with new animation features.

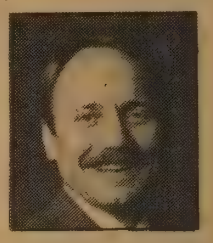


MARK HOFFMAN

President

Sybase

Pioneering the client-server architecture concept in relational database technology, Sybase is coming into its own, growing rapidly, and increasing its presence in network and workstation environments. With the advent of OS/2, Sybase's SQL Server will form the heart of the Microsoft/Ashton-Tate networking strategy. NeXT shipped its workstations in 1989, with the Sybase database engine a key part of its bundled development environment. Sybase, in fact, was a prominent part of new product announcements for most of the year.



DAVE HUGHES

Operating Officer

Old Colorado City Communications

It's a little difficult to get Dave to tell us what he's been up to this year; every time we ask, he tells us about another of his proteges. Nonetheless, he's been connecting people all over the world via modem and generally being the chief gadfly of the telecommunications world.

One notable achievement was shared by Dave and his son Ed, who by chance was spending a year teaching in China. Before, during, and after the events in Beijing in June, Ed was able to use alligator clips and other kludges on his primitive phone to set up a modem link with his father's system in Colorado. The result was a series of fascinating reports with an inside viewpoint, offering a different view of Chinese life from the mass-media version.

STEVE HUI

President and CEO

Everex

"At Everex, our goal is 'always innovate, never compromise,'" says Hui, who in six years has brought Everex from a clone-vendor startup to an international supplier of complete PC systems as well as UNIX and Macintosh products. This year he's also expanded the company's sales effort from an exclusively in-house sales force to distribution deals with giants Softsel and Ingram-Micro D.

CHARLIE JACKSON

Founder and President

Silicon Beach Software

Former Marine officer and independent-minded entrepreneur, Jackson founded Silicon Beach to deliver state-of-the-art Macintosh software, and he's been at it ever since. Not content with having provided the Mac market with such winners as Digital Darkroom, SuperPaint, Super 3D, and the ever-popular Dark Castle family, this year Silicon Beach shipped SuperCard, a HyperCard-compatible software toolkit which, unlike HyperCard, supports niceties such as 256-color Draw and Paint, animation capabilities, and mixed fonts.

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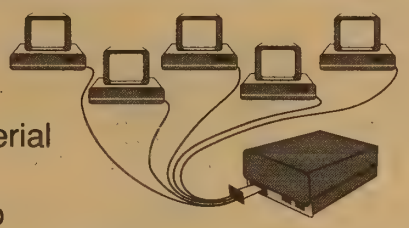

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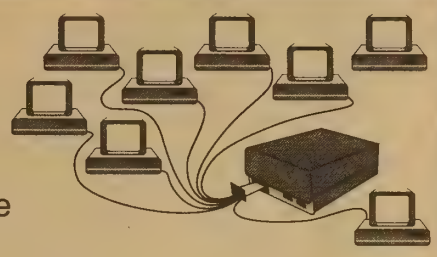

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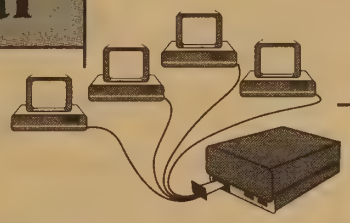

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STEVEN P. JOBS
President and CEO
NeXT, Inc.
It's too soon to tell yet what's going to happen to the Black Box. Confounding the naysayers, NeXT did begin shipping its workstations and its much-delayed 1.0 Mach operating system. To use the machine is to experience serious computer lust—from the interface to the bundled software to the sophisticated features like PostScript-and-voice electronic mail, the machine shows a wonderful attention to detail and getting it right.

It remains to be seen whether either the university community or corporate America will embrace the NeXT in the numbers Jobs would like. However, he seems to have acquired a streak of judicious pragmatism—as part of his strategy to get the machine into the business world, Jobs forged an alliance with systems integrator Businessland. He also received capital and made a Japanese distribution agreement with Canon.

In our experience, it is impossible to use this machine and not to passionately want it to succeed. We salute Jobs for bringing a great idea to fruition.

REESE JONES
Founder and President
Farallon Computing
Integrating computers and telephones, and making them work together in innovative and useful ways, is Farallon's corporate mission, and in its short history Farallon has grown from BMUG spinoff to the leader in low-cost Mac networking.

This year Jones's passion for innovation found expression in a host of new Farallon products, including the Timbuktu and Timbuktu Remote packages for accessing and manipulating Macs on networks or at remote sites. Anticipating the eventual arrival of multimedia network communications—such as those available on the NeXT—Farallon has also been active in sound applications, and its MacRecorder has been used by hordes of users to make Macs emit sounds Steve Jobs never imagined.

PHILIPPE KAHN
President and CEO
Borland
Last year was a little turbulent for Borland, with much management upheaval and reorganization. However, Kahn clearly has the company back in top form and dealing well with both its technical and corporate markets. Several languages came out in enhanced versions this year, while the Quattro spreadsheet benefited from Lotus's difficulties and made considerable inroads into the 1-2-3 market. The Paradox database, which pioneered the notion of consistent user interfaces across hardware platforms, is also doing well.

Not that Borland entirely escaped turbulence in 1989. The October 17 earthquake damaged one of its twin buildings so severely it had to be condemned. However, the stalwart Borland employees simply doubled up in the other building and resumed business as usual. Quattro Pro shipped as scheduled the next week.

MITCH KAPOR
Chairman and Co-Founder
ON Technology
Lotus founder Kapor's new startup expects to ship its first applications in mid-1990. Its focus is on products to help people manage information better in group-work situations, and the first programs will be for the Macintosh.

In addition to his entrepreneurial interests, Kapor is an astute observer and frequent speaker on economic and trade issues that affect the high-tech industry.

GUY KAWASAKI
Acius, Inc.
By year's end, Kawasaki had resigned as the database company's first president, leaving it to its French founders, and embarked on as-yet-unspecified adventures. Not, however, before the long-awaited 4th Dimension 2.0 shipped to eager users and developers.

Also not before Scott Foresman had published his book, *The Macintosh Way*, an alternately practical and hilarious treatise on Mac history, Mac theology, and guerrilla marketing in high tech.

SUSAN BAAKE KELLY
Author
Kelly is the author of books on WordPerfect for Sybex Books. Reader Dot James of San Jose nominated her with these words: "Absolutely the best—most coherent, concise, and clear—writer on how to use WordPerfect in all its versions."

DAVID T. KEARNS
Chairman of the Board and CEO
Xerox Corporation
Xerox started and ended the year with interesting moves. At the beginning of the year, it recruited departing IBM Entry Systems Division president William C. Lowe to head its developing and manufacturing operations, where he is responsible for planning, developing, and manufacturing virtually all Xerox products and systems.

Then in December, Xerox dropped the industry's most long-awaited Other Shoe—it announced that Apple had failed to properly license the Xerox PARC technology which was the foundation for the Lisa and Macintosh interface, and, when Apple wouldn't settle out of court, sued.

It remains to be seen what developments will emerge from these decisions, but they're likely to be far-reaching.

WILLIAM KRAUSE
Chairman of the Board and CEO
3Com
During 1989 Krause worked to position his company, a leading vendor of network systems, to take advantage of the market's migration to multi-vendor environments and client-server architecture. 3Com co-developed with IBM software to allow Ethernet support of OS/2 Extended Edition workstations, and joined forces with Hewlett-Packard to co-develop and market products to allow resource sharing between OS/2 and UNIX networks. It also began shipping 3+ Open LAN Manager, a new operating system co-developed with Microsoft.

BERNARD LACROUTE
Chairman of the Board, CEO, President
Dynabook Technologies Corporation
It's been quite a year for Lacroute, who abruptly left his position as executive vice president at Sun Microsystems for a position at venture capitalist Kleiner Perkins Caufield and Byers, and then, in November, assumed the head management position at Dynabook. Another KPCB company, Dynabook (which has nothing to do with the Dynabook concept of Apple Fellow Alan Kay) makes one of the new pocket-sized MS-DOS machines, which was released to somewhat disappointing reviews from those who found it both larger and more expensive than some of its competition. Lacroute faces some challenges, from the expansion and development of the company's product line to the defection of one of Dynabook's key engineers, but his track record at Sun and other successes suggest the unwisdom of betting against him.

CHIP LACY
Chairman of the Board and CEO
Ingram-Micro D
Lacy started the year as the CEO of Micro D, the third-largest distributor of computer products in the country, with strong presence on the West Coast. By year's end, he was CEO of a new mega-distribution entity created by the takeover of Micro D by Ingram Industries, the country's largest such distributor. As chief of the largest computer wholesaler in the world, Lacy is focusing his personal attention on developing its international markets and developing long-term strategy.

JAMES P. MANZI
President and CEO
Lotus
In its 1988 Corporate Elite directory, *Business Week* brought up a startling statistic: "Last year, Lotus Development Corp. paid James P. Manzi roughly as much money in a single year, $26.3 million, as IBM's Thomas J. Watson Jr. made in his 15 years at the helm of Big Blue—even allowing for inflation." (IBM's own current chairman John Akers, at $1,419,000 for the same year, didn't come close.)

While Manzi has become a convenient icon for the salary ranges of high-tech executives, he's also had a very busy year. While there were mixed reactions about the splitting of Lotus 1-2-3 into two versions with different capabilities, the company moved aggressively into new areas, shipping the well-received Magellan disk management utility, and announcing ROM card versions of 1-2-3 for both the NEC Ultralite and the Poqet PC. Perhaps most significantly, Manzi issued ringing endorsements of the UNIX operating system on several occasions, and during the summer announced a joint development and marketing agreement with Sun Microsystems, as well as an investment in still-private Sybase.

JOHN MCAFEE
President
Computer Virus Industry Association
In what may yet be recorded as The Year of the Virus, McAfee's organization disseminated information on the consequences of viruses and what you can do about them, and also lobbied for tougher anti-virus legislation. It established a clearinghouse of information for reporting infection occur-

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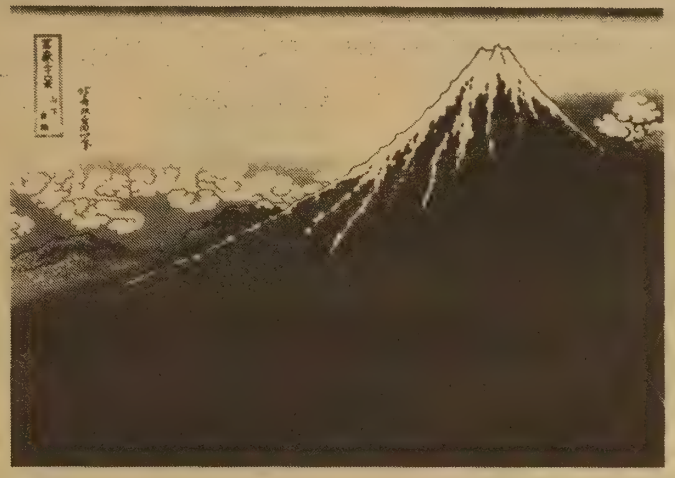

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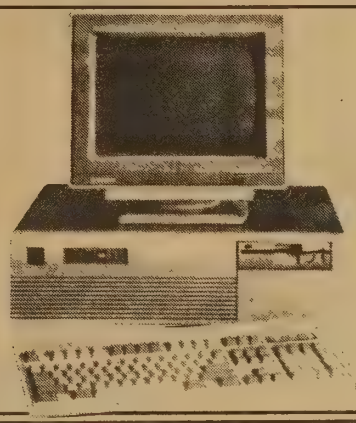

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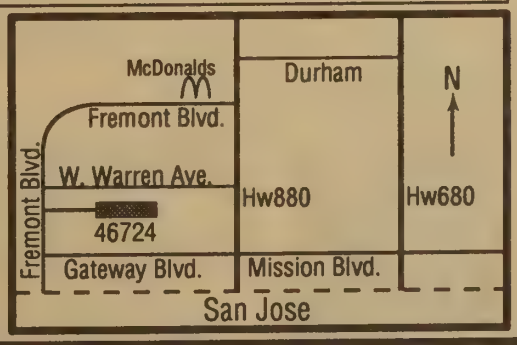

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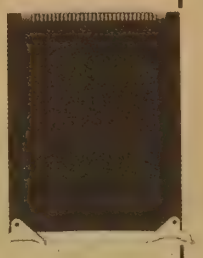

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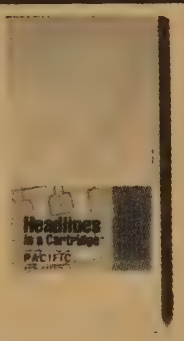

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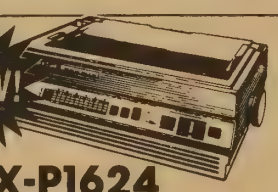

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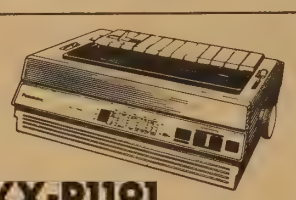

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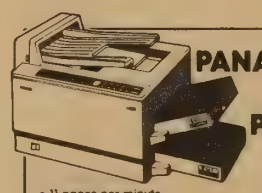

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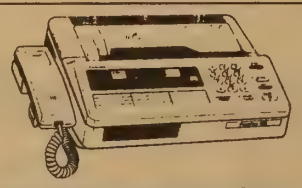

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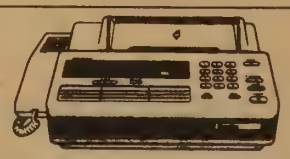

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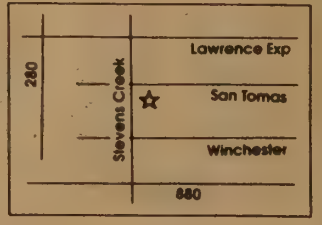

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MS 386 Window	119
MS 286 Window	76
MS Word	207
MS Works	99
MS Excel	292
MS Flight Simulator	39
MS Window D. Tool Kit	309
MS OS/2 Present Man	339

OTHER SOFTWARE

Desq View 286 2.2	$79
Desq View 386	128
Hard Round Graphics	285
Lotus 123 Rel 3	335
Norton Commander v3.0	89
Norton Utility (Advan)	85
Pacific Data for HP Laser	See Other Page
PageMaker	475
Word Perfect 5.1	255
Wordstar	235
Xerox Ventura 2.0	519
Speed Store Format	38

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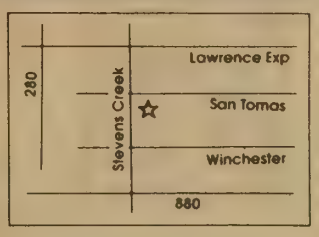

rences and local research data.

Reader Mike Durkin, who suggested McAfee for this year's list, said he thinks McAfee deserves recognition "for putting up with the criticisms from the private sector for the media's self-feeding hype and sticking with his fight against computer viruses."

PATRICK J. MCGOVERN

Chairman of the Board and CEO

International Data Group

As the computer industry comes to the increasing realization of the necessity of dealing with interdependent global markets, McGovern has positioned his company as the leading information resource for a global high-tech industry. IDG computer magazines and journals, which include *InfoWorld*, *ComputerWorld*, *Macworld*, *PC World*, *AmigaWorld* and *Publish!* in the US, are published locally on five continents.

We don't know whether McGovern's recent expansions into the USSR and Hungary had anything to do with the recent political shifts, but those computers are like that...

SCOTT MCNEALY

Chairman of the Board

Sun Microsystems

Doomsayers rejoiced this year as seemingly invincible Sun suffered its first-ever quarterly loss and the departure of two key executives. Still, McNealy and Sun finished out the fiscal year in fine form, with a 68% increase over fiscal '88's revenues.

A significant contribution to Sun's success and a key component in its future strategy is its SPARC technology; it entered into numerous licensing agreements in an effort to quickly develop a broad base of hardware platforms and software applications based on Sun's own RISC technology. This year Sun moved along nicely in this direction, shipping lots of SPARC systems (including the hot and relatively affordable SPARCstation 1); it also announced the availability of over 1,000 software applications for the new machines and entered into numerous licensing agreements with chip vendors including Toshiba and Philips.

BILL MENSCH

Western Design Center

Says *MicroTimes* contributing editor Mike Markowitz, who nominated Mensch: "Usually, to design a microprocessor (CPU) chip, you have to be Motorola or Intel, with vast resources and armies of engineers. Bill Mensch, the maverick designer of the 65816 chip used in the Apple IIGS, is a rare exception—a creative individual who can realize his ideas in silicon."

LARRY MICHELS

President

DOUG MICHELS

Vice President

The Santa Cruz Operation

If ever there was a company positioned to take advantage of the increasingly ubiquitous 80386 chip, it's SCO. As OS/2 appeared all but stalled at the starting gate and DOS was unable to take advantage of the new hardware's power, SCO sold unprecedented quantities of UNIX to Intel-based clients.

Says Intel's Gordon Moore, "More UNIX runs on Intel processors than any other processors, which is a fairly well-kept secret. A large number of the 386-based machines that are sold are sold into UNIX applications." Since SCO is the sole source of Intel-based UNIX, we leave the implications to your imagination.

CAROL MILTNER

Senior Vice President, Sales

Softsel

Miltner is in charge of all the US sales activities of Softsel, one of the largest worldwide distributors of computer products. Arriving at Softsel last April after four years at rival distributor Micro D, she is in charge of developing such emerging programs as the Connectivity Solutions, UNIX Solutions, and Education Services division in addition to overseeing the company's sales and support efforts. As retailers and distributors struggle with the implications and practical challenges of serving an ever-more-complex market as networked and multiuser systems become more prevalent, Miltner will be very influential in creating an effective sales channel.

In addition, Miltner was elected to board of directors of ABCD: The Microcomputer Industry Association, a nonprofit trade association dedicated to serving the needs of the microcomputer industry.

THERESE MYERS

President

Quarterdeck

While Microsoft and IBM continued to endorse OS/2 and make less-than-clear statements about it, one thing was very clear—OS/2 wants fast hardware and lots of memory in order to deliver the benefits of multitasking.

As a result, users of XT and 286 machines—as well as 386 owners—have been flocking to DESQview, Quarterdeck's constantly enhanced flagship product which allows true multitasking even on less powerful and less RAM-packed machines. This year, Quarterdeck further strengthened its position in the marketplace by securing some key patents and releasing a series of products to help users more effectively manage the memory in their machines.

ARTHUR NAIMAN

Author

Macintosh users everywhere sing the praises of Naiman's book, *The Macintosh Bible*, now in its second edition, still self-published and still offering its popular two free upgrades. Novice and expert alike find that when your Mac does something strange, or when you're trying to get it to do something strange, this is the book to have.

RAY NOORDA

President and CEO

Novell, Inc.

Ray Noorda took just another hardware systems company and turned it into a pioneering networking company that all but owns the network operating system market. What began as a mission to link together the resources of DOS and CP/M machines has become the grand goal of connecting every known type of computing machine (well, almost) into a seamless whole. DOS, MacOS, VAX, VMS, mini, micro, and mainframe all fall under the purview of Novell's NetWare. What will the future bring to the world of networking and connectivity? More of the same, says Noorda: "It will be distributed, networked computing allowing people to make their choices of different functions and different operating systems and different protocols. I think that's the whole business for the future."

DAVID A. NORMAN

Chairman of the Board, President, and CEO

Businessland

Along with co-founder Enzo Torresi (who's moved on to NetFRAME, makers of innovative network machines that Businessland will be selling), Norman founded Businessland in 1985, pioneering the concept of systems integration (configuring what the client needed using products from a variety of vendors) to meet the increasingly complex needs of business users. In 1989, Norman made some strategic moves to keep Businessland on the cutting edge, creating the Advanced Systems division to address the problems of larger systems.

Businessland suffered a bit of a setback earlier in the year when diehard EISA proponent Compaq, which accounted for a substantial portion of Businessland's sales, decide to pull its product line as a result of Businessland's support of IBM's Micro Channel Architecture. Norman, however, bounced back happily a couple of weeks later, appearing onstage with Steve Jobs to announce Businessland's agreement to be the sole retail source in the US for the NeXT. Luckily enough, Businessland, which operates chiefly with an outbound direct-sales force, had acquired the ComputerCraft retail chain, so it had a ready outlet when the black boxes finally started shipping.

PETER NORTON

Founder and Chairman of the Board

RON POSNER

President and CEO

Peter Norton Computing

Peter Norton

Ron Posner

Norton's utilities business, which has grown approximately 75% per year since its founding in 1982, got big enough this year that he recruited Posner, late of Borland, Ansa, and Ashton-Tate, to get the company ready for some new challenges—notably expanding into the UNIX and Macintosh marketplaces. Posner began to develop a new management team and to work on strengthening Norton's presence in the corporate marketplace, one of Posner's long-time areas of expertise.

Meanwhile, Norton shipped Norton Commander 3.0, the newest version of its DOS manager, and announced The Norton Backup—insurance for those files even The Software Saint can't save.

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ROBERT NOYCE
President and CEO
Sematech

Intel co-founder Noyce's first year at Sematech, the nation's semiconductor manufacturing consortium, produced some noteworthy achievements, including the production of its first SRAMs three days ahead of schedule and a number of joint development contracts. Long-term, the company hopes to return the United States to its former leadership position in cutting-edge semiconductor manufacturing through cooperation among its member companies.

Independence from Japanese chip vendors is a priority. Sematech's annual report quotes Shintaro Ishihara, co-author of the bestselling *The Japan That Can Say No*, who writes, "Should Japan decide to sell its chips to the Soviet Union instead, that would instantly alter the balance of military power."

FRANK ODASZ
System Operator
Big Sky Telegraph

As his mentor Dave Hughes says, Odasz's initiative in founding Big Sky two years ago has resulted in a system that's become a veritable model for rural education via telecommunications and an information exchange platform that transcends its original function of linking Montana's one-room schoolhouses.

Says Hughes, "Over 500 very rural Montanans are online from the smallest towns, having logged on something over 20,000 times. The vast majority long distance direct-dial over rural phones. It went public for education in January 1988. It was a success from the beginning, but the main point is that it burst the bounds of 'just education' in rural America within months, and has been expanding into every collateral area ever since—as a system, as a solution, as a model, as a future. He has had calls from all over the country by people looking to use modem telecom for solving rural problems. Once it became 'for real,' a lot of people looking for power, ease of use, and an institutional backup flocked to it, and him."

MICHAEL ODAWA
President
Software Development Council
President
Software Entrepreneurs' Forum

Odawa's had a busy year presiding over two significant software industry associations. SDF consists of several industry organizations banded together to address concerns of the software industry, and this year Odawa's become a frequent spokesman for the fight against viruses. SEF, a well-established Silicon Valley group, helps would-be software entrepreneurs do some creative networking and get their product out of the garage and into the marketplace.

KENNETH H. OLSEN
President
Digital Equipment Corporation

Last spring we interviewed Oracle founder and CEO Larry Ellison. In the course of the conversation came this exchange:

A lot of people will assert that the talents a CEO needs to take a company from the startup phase to a mature stage are different from those needed to guide a mature company.

Say that to Ken Olsen. Ken Olsen started DEC—it's now a $12 billion company.

But they've stumbled a bit along the way.

Yeah, everyone stumbles a bit along the way. I hope Oracle stumbles just like DEC—that very same way.

A lot of industry leaders would undoubtedly agree. During 1989, Digital's revenues grew to $12.7 billion, it climbed to #30 on *Fortune*'s list of the largest US industrial corporations and was selected by *Manufacturing Engineering* magazine as one of the ten best American manufacturing companies at which to work.

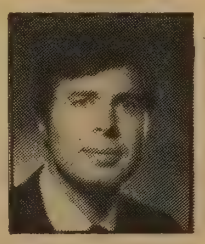
In addition, DEC shipped new VAX systems, including the powerful VAX 9000, and RISC-based UNIX computers. It achieved and published technical breakthroughs in multi-chip packaging, and shipped the DECwindows software, which offers consistency across micro, mini, and PC hardware on networks.

ADAM OSBORNE
President and CEO
Paperback Software

Taking advantage of fragmentation in the Lotus market, Osborne went right on selling lots of VP-Planner—as evidenced by the fact that chicken conglomerate Foster Farms, a diehard 1-2-3 user, chose VP-Planner Plus over Lotus and Excel.

While low cost has always been a byword with Osborne, PSI's products are no stripped-down programs and are in a continual process of enhancement—at COMDEX Osborne announced a new three-dimensional version of VP-Planner, and the company shipped a new SQL version of VP-Expert.

JOSEPH L. PARKINSON
Chairman of the Board and CEO
Micron Technology



Parkinson announced to Micron's shareholders that 1989 was the most successful year in the company's history, with revenues of over $400 million and net income of over $100 million. In addition, the company, which is the only US-based supplier of DRAM, opened a new fabrication facility to prepare for a more prosperous and demanding future.

1989 saw the introduction of Micron memory boards for the PS/2 and Compaq systems, as well as video boards for Macintosh.

NORMAN PETERSEN
President, Computer Products Group
Fujitsu America

Recruited some years ago from Data General, Petersen knows the ways of Big American Computer Companies. As president of Fujitsu America's Computer Products Division, he is faced with the task of blending Japanese and US culture into a quality-conscious Japanese-owned American company.

He seems to be doing quite well with it. Long a mainstay of the large computer world, Fujitsu storage devices are attaining wide popularity among microcomputer vendors for their great reliability and low failure rate. This year also saw the release of the first Fujitsu laser printers that can be used in Macintosh as well as PC environments.

Product aside, it is particularly noteworthy, and greatly to Petersen's credit, that Fujitsu's American disk drive plant in Hillsboro, Oregon, not only surpassed the production of its Japanese counterparts recently (supplying drives to the US and several foreign markets), but that its engineers devised an improvement in the manufacturing process that's now being adopted at Fujitsu plants in Japan.

STAV PRODROMOU
President and CEO
Poqet Computer

Prodromou deserves considerable praise for having developed and brought to market the videocassette-sized but powerful Poqet Computer. While the machine incorporates many technological breakthroughs, the most significant may well be its ability to run 100 hours on a pair of AA batteries.

Now that alone deserves an award, as hordes of portable computer users will attest.

SAFI QURESHEY
Co-Chairman, President, and CEO
THOMAS YUEN
Co-Chairman, COO
AST Research

1989 found AST's co-founders hard at work reinventing their company to focus exclusively on the PC-compatible marketplace, dropping its Apple and DEC-related operations. It announced its commitment to the EISA bus standard and to the Intel 486, beginning with the FASTBoard 486/25, which upgrades existing AST 386 systems to the newer, faster processor.

Additionally, AST expanded aggressively into the dealer channel with several major distribution deals and entered into an OEM agreement with Tandem Computer.

DAVID RAMSEY
Former Apple Programmer

This was the year that Apple (no doubt goaded by the appearance of its internal secrets on the front pages of *MacWeek* month in and month out) decided that it needed to get serious about information leaks. It launched a poster campaign showing various key personnel in paper-shredding and speak-no-evil guises, and generally tried to cork the trickle of secrets from Cupertino.

The most visible casualty of this campaign was David Ramsey, one of the company's most senior programmers, who was substantially responsible for MacPaint 2.0 and very zealous about helping users in various Macintosh online forums. Apparently one day Ramsey, in the course of answering a user question on CompuServe, alluded to an Unannounced Product. True, Apple senior executives had alluded to the same Unannounced Product in public statements, so Ramsey thought he was on safe ground, but never mind—Ramsey was summarily fired, amid great fanfare.

Ramsey was deluged with offers of work. Apple

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- 101 Enhanced Keyboard
- 165 W Power Supply
- AT Jr. Case

$289

286-16 MHz 0 Wait

- Landmark=21
- 512K Expandable to 4 MB
- Chip & Tech. NEAT Chip Set
- Shadow RAM
- EMS LIM 4.0 Built-in
- Page Interleaved Memory
- 1:1 HD/FD Controller
- Teac 1.2 or 1.44 MB Floppy Drive
- 230 W Power Supply
- 101 Enhanced Keyboard

$659

Motherboard

DTK 8088 10 MHz	$69
286 6/12 MHz 0 Wait	155
286 8/16 MHz 0 Wait	295
286 8/20 MHz 0 Wait	320
386SX-16 MHz 0 Wait	325
386SX-20 MHz 0 Wait	335
386-20 MHz 0 Wait (w/o CPU)	385
386-25 MHz 0 Wait (w/o CPU)	425

Modem

Everex 1200 Baud (Int)	$55
Everex 2400 Baud (Int)	115
Everex 2400 Baud (Int MNP5)	150
Everex 2400 Baud (Ext)	165
Everex 2400 Baud (Ext MNP5)	195
Everex Fax Modem (9600 Fax, 2400 Modem, MNP5)	275

Misc.

80287-8/10	$195/220
80387-16/20	325/370
80387-25/33	460/510
165W (XT) Power Supply	35
230W Power Supply	48
LogiMouse C7/Bus	55
Logi Hi-Res Mouse	69
DFI Scanner	175
AT Jr. Case (XT)	32
AT Deluxe Case	55
Mini Vertical Tower Case w/Power Supply	125
Vertical Tower Case w/Power Supply	175
Colorado 60 MB Tape Back-Up	289

Interface Card

Mono Graphic Card	$35
Color Graphic Card	35
Floppy Controller 360/720/1.2/1.44 XT/AT 2/4 Drive	33/49
Everex EGA (640x480)	79
EGA Card (800x600)	85
VGA Card (8 bit 800x600)	99
Paradise VGA + 16 (OEM)	125
Trident VGA 16 (1024x768)	125
ATI Wonder (1024x768)	225
AT M I/O (2S, 1P, 1G)	29
WA3 FD/HD Controller	75
1:1 FDC/HDC	85
DTC 7280 1:1 FDC/HDC	99
DTC 7287 1:1 FDC/HDC (RLL)	125
ST-02 Seagate SCSI Host Adapter	69
DTC 6280 ESDI	185
OMTI 8642 ESDI	185
Adaptec 1542 SCSI	299

Floppy Drive

Fujitsu 360K/1.2M	$59/69
Teac 360K/1.2M	63/76
Teac/Toshiba 3.5″ 720K	69
Teac/Toshiba 3.5″ 1.44 MB	75

Printer

Star NX-1000 II	169
Star NX-1000 Color	225
Star NX-2400	279
Panasonic KX-P 1180	175
Panasonic KX-P 1191	225
Panasonic KX-P 1124	295
Panasonic KX-P 1624	469

Monitor

Hyundai Mono	$70
14″ Flat Screen	95
Samsung Color	199
Samsung EGA	315
Hyundai EGA	310
Hyundai VGA	325
Samsung Multisync	410
Relisys Multisync	425
NEC Multisync 2A	499
NEC Multisync 3D	639

Hard Disk

ST-225 (20 MB)	$195
ST-225 Kit	235
ST-238 Kit (30 MB)	265
ST-251 (40 MB, 39 MS)	309
ST-251-1 (40 MB, 28 MS)	319
ST-4096 (80 MB, 28 MS)	545
ST-296N (SCSI 80 MB, 28 MS)	499
Toshiba 134FA (44/66 MB, 24 MS)	385
NEC 3142 (44/66 MB, 24 MS)	385
Fujitsu ESDI 150 MB, 24 MS	795
CDC ESDI 150 MB, 18 MS	1100
Maxtor 4170E ESDI 150 MB, 14 MS	1095
Maxtor 4380E ESDI 320 MB, 16 MS	1750
Maxtor 8760E ESDI 660 MB, 16 MS	2750
CDC SCSI 150 MB	850

Keyboard

Mitsumi 84 Key	$35
Mitsumi 101 Key	39
Keytronic 101 Key	45

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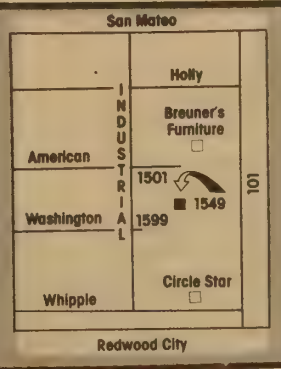


looked ridiculous. No word yet on how the secrecy campaign's going.

JACK RICKARD
Publisher
Boardwatch Magazine
Telecommunications gadfly Dave Hughes, who turns up on our list himself, nominated Rickard, who operates a multi-line TBBS system and has published *Boardwatch* for three years.

Says Hughes: "Rickard's influence comes from the fact that his newsletter/magazine, which started as only a listing and comment of Colorado dial-up services three years ago, is national in scope now, and since it treats only telecom matters at a level not touched by *Communications Daily* or *Data Communications*, is being ordered and read by large entities—such as utility commissions and telephone company executives. It tracks developments better and is so independent editorially that it is a good source of trend information.

"Dvorak asked him to write the introduction to Dvorak's own massive telecom tome. Glossbrenner is going to do a column for him. At COMDEX he was invited into some inner sanctums.

"Yet his rag is read because, as a technical writer for large firms (a position he relinquished recently, having gone solo, a move than indicates that he is expanding well), he edits a good, solid magazine, not too techie, not too general, and not too corporate."

JOHN ROACH
President, CEO, and Chairman of the Board
Tandy
The multifaceted Tandy continued to expand its operations and increase its presence in various microcomputer markets. It endorsed the EISA standard and is working on its own EISA-based machines. At the consumer level, the DeskMate software interface found widespread acceptance among users and vendors alike, with over 100 packages that support the interface shipping and the August announcement of a DeskMate version of Lotus 1-2-3. In the portable computing market, Tandy worked to integrate its newly-acquired GRiD Systems operation, which pioneered portable computing and does a considerable business in military, government, and Fortune 500 markets utilizing its own outbound sales force, with its more storefront-oriented sales channel. As a result, while GRiD's outbound sales force continued to call on its traditional markets, selected low-end GRiD portables also began to appear in Tandy stores.

Most intriguingly, Roach was dropping strong hints of the further strategic implications of the GRiD merger—apparently the portable computing pioneer acquired a few key patents on its technology back in the old days, upon which much of the current state of laptop technology may well be based.

HEIDI ROIZEN
President
T/Maker Company
President
Software Publishers Association
In between incidental activities like shipping WriteNow 2.0 on both the Mac and NeXT platforms, Roizen worked tirelessly all year to increase awareness of issues and problems affecting software vendors, most notably the SPA's ongoing campaign against software piracy. Moving into the international arena, she was chosen to represent the US software industry at the meeting of the Japan Personal Software Association in Tokyo in March.

Not surprisingly, in July 1989 she was elected to another term as SPA president.

DELTON J. ROWE
President
Cadman Corporation
Cadman is a four-year-old company in Torrance that develops and markets factory automation software for IBM and compatible personal computers.

Reader Jack Cherne of Santa Monica, who submitted Rowe's name for consideration, explains that Rowe "invented, designed, and marketed ViewPort+ software for viewing, annotating, and printing CAD documents from any CAD system on PCs." As a common denominator between dissimilar applications and systems, Viewport+ aspires to help in the creation of "automated, paperless factories" for the Fortune 1000.

WAN RUNNAN
Founder and President
The Stone Group
Currently head of the Federation for a Democratic China, an organization of student and business leaders formed in exile in the wake of Tiananmen Square, Wan Runnan first distinguished himself in China as the president and founder of The Stone Group, the country's first privately-owned computer company. The Stone Group, which came into being under the Chinese government's short-lived encouragement of private enterprise, attained such prosperity that it rapidly became a showcase and grew constantly.

Then came Tiananmen Square, and Wan Runnan was forced to flee the country. In exile, he works not only for the establishment of democracy in China, but for the creation of a business climate conducive to successful high-tech enterprises and joint ventures with other countries.

EDWIN RUTSCH
Modular Information Systems
Rutsch's self-published books (*The IBM XT Clone Buyer's Guide*, *The AT Clone Buyer's Guide*, *The 80386 Clone Buyer's Guide*) provide invaluable information for the would-be computer customer and have long been a key resource for the PC community. Says reader Dot James of San Jose, "Rutsch's how-to-buy guides are going to keep me from making the mistake I made six years ago, viz. buying a CP/M computer that was already obsolete." Not only that, his books provide an accessible introduction to the subject of computing and provide useful tips on the differences between various products and vendors.

JUDGE WILLIAM SCHWARTZER
Apple/Microsoft Suit
Schwartzer, who took over the Apple/Microsoft look-and-feel case from Judge Robert Aguilar, made headlines by dismissing most of Apple's charges that Microsoft infringed on its technology in the creation of Windows. While some issues remain, notably those having to do with overlapping windows, Microsoft chose to take the decision as an unadulterated triumph.

While we would like to report that this development slowed the parade of high-tech litigators to the courtrooms, we are regrettably unable to do so.

KEITH E. SCHAEFER
Senior Vice President
NEC Home Electronics
Schaefer's been responsible for a good many products since he took over the computer products division in 1986. This year's big breakthrough was undoubtedly the first entry in the smaller-than-laptop portable computer market, the NEC Ultralite, further strengthening the company's position in outbound applications and field personnel support.

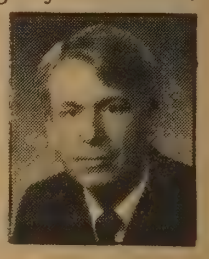
JOHN SCULLEY
Chairman of the Board and CEO

JEAN-LOUIS GASSEE
President, Apple Products
Apple Computer
1989 saw an opening of the product floodgates at Apple, with four new Macintoshes, including the long-awaited Portable. Gassee, being in charge of Apple Products, was much in the limelight this year, boldly assembling a IIcx onstage at the product unveiling and holding candid discussions with users at AppleFest, even allowing as how Apple was reconsidering the 90-day warranty that's become an increasing stumbling block to the acceptance of Apple products.

Secrecy was a big concern at Apple this year, and Sculley starred in a promotional video depicting his sleepless nights worrying about information leaks.

The earthquake hit Apple relatively hard in spots—its almost-new DeAnza III building sustained such severe water damage it had to be condemned. However, operations were back to normal almost immediately—as one indefatigable employee said, "We're Apple. You knock down one building, we'll move to another building..."

JONATHAN SEYBOLD
Publisher
Seybold Report on Desktop Publishing, Seybold Report on Publishing Systems
President
Seybold Publications and Seminars
"Best show in the business," says our own Bill Reefer of the annual Seybold Computer Publishing Conference Expo, and he's got a point. As the Macworld Expo got increasingly glitzy and bloated, and the Computer Faire degenerated to a pathetic shell of its former self, this year's Seybold show managed to combine exciting products, industry luminaries, and great demos in an event that left you more starry-eyed than glassy-eyed.



Jonathan Seybold himself is probably the most influential observer and analyst of the computer-based publishing industry, able to distinguish rhetoric from information and offer well-founded guidance on market directions and the judicious choice of high-tech tools.

ALAN SHUGART
CEO
Seagate Technology
Already the world's leading independent supplier of storage technology, and still under the management of its founders, Seagate grew substantially as

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- 101 Keyboard
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- Hard/Floppy Controller (1:1)
- Teac 1.2 MB or 1.44 MB Floppy Drive
- Serial, Parallel, Game Port
- 101 Keyboard

$1139

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- 20 MHz board with 20 MHz CPU
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- Hard/Floppy Controller (1:1)
- Teac 1.2 MB or 1.44 MB Floppy Drive
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- 101 Keyboard

$1039

386-SX 20 MHz System

- Intel 386-SX CPU
- 1 MB RAM on board, Landmark=21.6
- Hard/Floppy Controller (1:1)
- Teac 1.2 MB Floppy
- Serial, Parallel, Game Port
- 101 Keyboard

$775

Super Fast 286-20 MHz Neat System

- True 20 MHz Harris CPU
- C&T (Neat) 20 MHz Chip Set
- EMS; LIM 4.0; Landmark=26
- 512K exp. to 8 MB on board; Interleaved Memory
- 1.2 Floppy Drive; HD/FD Controller
- 101 Keyboard

$745

286-16 MHz System

- 512K RAM on board
- Hard/Floppy Controller
- 1.2 Floppy Drive
- 101 Keyboard

$599

Turbo 10 MHz Complete System

- DTK 10 MHz Turbo Motherboard
- 256K RAM exp. to 640K
- MGP/Mono Monitor
- 84 Keyboard • 360K Floppy Drive

$379

286-12 MHz System

- 512K RAM
- 1.2 Floppy Drive
- Hard/Floppy Controller
- 101 Keyboard

$509

Disk Drives

Teac 360K/1.2K	$65/75
Teac 720K/1.44K	69/79
Toshiba 720K/1.44K	68/78
Fujitsu 360K/1.2K	60/72

Monitors

Mono (Samsung 12″)	$75
Mono (14″ Flat)	105
Samsung Color Hi-Res.	219
EGA (Samsung 14″)	315
Everex VGA	369
Hyundai VGA	310
MultiSync (Samsung)	415
MultiSync (Relysis)	435
(NEC 2A 3D)	495/645

Keyboards

102 Key with Cherry Key Switch	$53
Keytronic 101 Key	48
Mitsumi 101 Key	42
Enhanced 101 Key	38

Add-On Boards

Mono Graphic w/PP	$39
Color Graphic w/PP	39
Everex EGA with PP	105
Orchid ProDesigner VGA-16 Bit	225
Everex EGA (640x480)	72
Everex (800x600)	85
VGA-16 Bit Trident	125
VGA-16 Bit Paradise OEM	130
Everex VGA-16 Bit	215
AT FD/HD Controller (2:1)	75
FD/HD 1:1 Controller	83
AT I/O (2S;1P;1G)	35
XT Multi I/O	39
Floppy Controller (360, 720, 1.2, 1.44K)	35
Floppy Controller (360K)	16
XT-H/D Controller WD-Gen	50
WA3 FD/HD Controller	83
DTC 7280 MFM FD/HD (1:1) interleave	125
DTC 7287 RLL FD/HD (1:1)	139

Modems/Fax Cards

Everex 1200 Baud (int)	$54
Everex 2400 Baud (int)	115
Everex Fax Modem	275
Everex 2400 Baud MNP (ext)	198
Everex 2400 Baud MNP (int)	169
CEI 9600 BPS Fax Card	395
CEI Pocket Modem	Call Now!

Printers

Okidata 320	$345
Okidata 321	459
Okidata 390	485
Okidata 391	650
Panasonic KX-1180	Sale 170
Panasonic KX-1191	225
Panasonic KX-1124	Sale 290
Panasonic KX-1524	519
Star NX-1000	165
Star NX-1000 Color	215
Star NX-15	320
Everex Laser Printer	1295

Motherboards

386-Various Make/Speed
286-10,12,16,20 Neat
XT-10 MHz
Call For Best Pricing

Miscellaneous

Logitech Scanner	$165
Color Mouse	35
Logitech C7 Mouse Bus	55
Logitech C9 Mouse	69
XT Power Supply	34
AT Power Supply	48
Memory Chips	CALL
All Kinds of Cases	CALL
DOS 4.01	65
DOS 3.3	65

Hard Disk

ST-225 (20M)	$195
ST-225 Kit	239
ST 238 (30M) Kit	275
ST-251-1 (40M)	329
ST 4096 (80M)	549
Toshiba 44/66 MB	389
Micropolis (71M)	550

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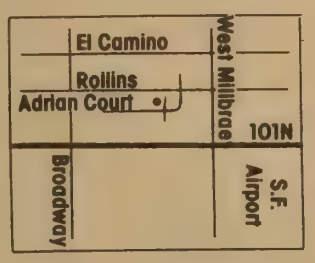


Service

- Hardware installation
- Trouble shooting
- Upgrade available
- Software installation
- UPS Daily Shipping

a result of its September acquisition of Imprimis Technology from Control Data. As a leader in US-based storage technology, Seagate is working to address the changing realities that make a global approach necessary, and operates sales and support offices in Europe, Asia, and Australia. During 1989 it adjusted to shifts in the marketplace as demand slowed for 5 1/4" drives and 3 1/2" drives accounted for about a third of the company's total sales; in addition, Seagate streamlined its operations by closing and selling some facilities and reducing overhead. As a result, the company rebounded from a first-quarter loss of $52 million to end the year with record revenues of $1.372 billion.

DAN SILVA
Programmer

Amiga users were delighted with this year's release of the latest version of Silva's Deluxe Paint classic. Deluxe Paint 3 offers tons of new features, including animation capabilities. Silva is one of the leading lights of the Amiga universe, continually at work to deliver new capabilities to users of Commodore's ultimate graphics machine.

ROGER J. SIPPL
Chairman of the Board and Founder

PHILIP E. WHITE
CEO

Informix

The former president of Wyse, White came to Informix last year to take over the CEO position from Sippl, who founded the company in 1980 and continues to serve as chairman, as well as being chairman of X/Open's Independent Software Vendor Council.

Since its foundation, Informix has been a leading vendor of relational database technology for UNIX and other platforms. In 1989 it broadened its efforts into new applications, finally shipping (after what seemed like years of announcements and tons of promotional doodads) its revolutionary graphical spreadsheet, Wingz for Macintosh, which featured a powerful application development language. The current version runs under Macintosh and A/UX operating systems, Informix being an early supporter of A/UX, and versions are being developed for OS/2 Presentation Manager, OSF/Motif, and NeXTStep. The company's also hard at work on an application that will allow Wingz to access information in SQL-based databases—including, of course, those sold by Informix.

Roger J. Sippl

DAVID SMALL
Gadgets By Small

Small is the creator of the Spectre 128 and the Spectre GCR, which allow users of Atari ST computers to run Macintosh applications on their machines. This year he shipped both these improved versions of his original product, which he's been continually refining for several years. Until the dawn of the Mac clone, Small offers the ultimate in low-cost Macintosh.

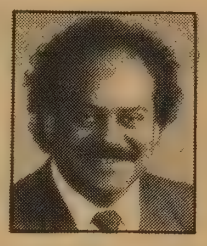
BARNEY STONE
Stone Edge Technologies

Mike Markowitz: "A powerful relational database for the little Apple II? A successful 8-bit, text-based program for professional users? That's DB Master, created by Barney Stone and his company, Stone Edge Technologies of Maple Glen, PA. Stone is an important voice in the Apple II community. Current projects include a new quarterly tabloid, *II At Work*, and an organization of independent developers that aims to promote the Apple II product line."

SAM TRAMIEL
President and CEO

Atari

1989 was not the best for Atari in the US marketplace, what with product shipment delays and the disastrous legacy of the company's acquisition of the Federated discount store chain. At the beginning of 1989, Sam Tramiel (son of founder and chairman Jack) wrote in the company's annual report: "Atari has two primary objectives in the year ahead. The first is to complete the disposition of the Federated Group, which will be done as smoothly and quickly as possible. The second major goal is to concentrate on our continuing operations. We plan to introduce new, exciting products and expand in all markets."



He did a good job of it, too. With Federated out of the picture, Atari outdid itself in new product introductions, and its European and Australian subsidiaries expanded rapidly (as an indication of Atari's widespread acceptance in non-US markets, the Atari 1040ST has already been chosen as a standard by Australia's two largest school districts), while its 8-bit line sold well in the Soviet Union. Meanwhile, Atari introduced the undisputed price leader in the new pocket-computer wars, the Portfolio, a DOS-based, videocassette-sized machine priced at a mere $399. Additionally, strengthening the ST/Mega product line, Atari introduced the smallest member of that product family, the Stacy laptop. The 68030-based Atari TT workstation, complete with UNIX capability, waits in the wings.

ROGER WAGNER
Roger Wagner Publishing

Markowitz again: "A leading programmer and writer of several books on Apple II programming, Roger Wagner's latest product is HyperStudio for the Apple IIGS. Similar in some ways to HyperCard on the Macintosh, HyperStudio allows users to create their own applications, including digitized sound and full-color graphics. It's a package with great strategic importance for the future of the Apple II in education."

JOHN WALKER
Co-Founder

Autodesk

Although Walker has abdicated the actual running of Autodesk to Alvar Green, he continues to exert a profound influence on the company's evolution by conceiving and developing new products (he collaborated with mathematician and scifi author Rudy Rucker on the CA Lab cellular automata product, and was the impetus behind Autodesk's 1988 acquisition of Ted Nelson's Xanadu project).

He also made a very specific contribution to the industry by publishing *The Autodesk File*, a warts-and-all compendium of Autodesk history compiled from letters, memos, and notes from the time when the company was a gleam in its founders' eyes until Walker returned to his computer in 1988. For the would-be entrepreneur or the industry observer, it's a fascinating inside look. One suspects that it will also be one of Autodesk's most effective recruiting tools. Witness its closing paragraph:

"Without imagination we are all doomed to lie in a grey world devoid of hope and excitement, fortune and glory. We talk about the Golden Age of Engineering. It's our age—if we work to build it. To achieve it, we must toil tirelessly at the gory details. If we invest that effort, our achievements will be unbounded, our horizons endless, and the potential for Autodesk incalculable."

BOB WALLACE
President

Quicksoft

One of the leading lights of the shareware world, Wallace believes firmly in responsiveness to customers. Consequently he and his small staff are constantly at work to improve their products for their highly committed customers.

In addition to continuing upgrades to the perennially popular PC-Write, this year Quicksoft made two new shareware products available: PC-Write Lite, for those who don't need all the original program's increasingly sophisticated features, and PC-Browse, a new pop-up file scanning and hypertext tool for the PC.

RALPH WARNER
Co-Founder

Nolo Press

Lawyer Warner founded Nolo Press some years back, offering self-help legal books such as *How to Do Your Own Divorce*, and *Everybody's Guide to Small Claims Court*. Eventually Nolo started shipping its first software products, and happy users of Will-Maker and For The Record have been saving big bucks on attorney's fees ever since.

JOHN WARNOCK
President and Co-Founder

CHARLES GESCHKE
Executive Vice President and Co-Founder

Adobe

It was a definite good news/bad news kind of year for Adobe. Some unmitigated triumphs—notably the arrival of the NeXT workstation with the first implementation of Display PostScript technology—and the introduction of several innovative new products, including Streamline and PhotoShop.

John Warnock

On the other hand, Apple unleashed a storm of controversy by entering into a new font technology agreement with Microsoft, a radical departure from its long-time commitment to Adobe's proprietary PostScript standard. An immediate result was that Warnock made public a great deal of hitherto secret PostScript code. Font wars lie ahead.

KEN WASCH
Executive Director

Software Publishers Association

Last year Wasch led the SPA's crusade against software piracy, filing over 30 lawsuits against corporations, hard disk loaders, mail operations, BBSes, and others involved in illegal duplication of software. In addition, the SPA installed an 800

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ACR Computer Systems

SYSTEMS

• AST

Premium 286	$1225
Premium 386	2710
Premium 386/25	3569
Premium 386/33	4265

• ALR

ALR-FSX10 -386	$2020
ALR-FZ225 -386	2764
ALR-F233- 386	3814
ALR-F33-150	7193

• COMPAQ

DeskPro 286M40	$2165
DeskPro 386/20	3465
DeskPro 386/25	5235
DeskPro 386/33	CALL

• NEC

Power Mate 286	$1305
Power Mate 286+	1789
Power Mate 386+	1769
Power Mate 386/20	2369

• HP

Vectra LS/12 M44	$2695
Vectra LS/12M10	1769
Vectra ES/12M26	1945
RS 20C M100E	3745
RS 20 M40	3194

• ACR

E-286/12	$820
E-386/SX	1250
E-386/20	1623
E-386/25	1895
E-386/33	2395

• MITSUBISHI

MIT-286312	$1115
MIT-286342	1762
MIT-386112	2351
MIT-386142	2939
MIT-386172	3292

• IBM

IBM 55-SXo31 386/16	$3895
IBM 60-041 286/10	5295
IBM 80-071 386/16	6995
IBM 70-A21 386/25	8995
IBM P70 386/20	7695
IBM P70 386/20	8295
IBM LAPTOP 386/061	5285

• APPLE

MAC SE 20 MB, 2 FL	$2185
MAC SE/30 1 FL	2985
MAC IIcx/40 MB	3575
MAC +/MAC IIci	CALL
Apple Laser Writer IINT	3345

• ACER

A160 386-16 MHz	$2281
A800 386-20 MHz	2890
A850 386-25 MHz	4200

MOTHERBOARDS

• MICRONICS

20 MHz/Cache 4 MB	$1385
25 MHz/Cache 8 MB	1990
33 MHz/Cache 8 MB	2655

• IBM Compatible (Clone)

286-12/16/20 MHz	CALL
386-20/25/33 MHz	CALL
486-25 MHz	CALL

• MONITORS

Monochrome 12"	$71
Amber Flat 14"	98
EGA Casper/Relysis	309/325
Seiko VGA CM1430	515
NEC 3D/4D/5D	599/1125/2229
Nanao 9070S/9500S	939/2769
Sony 1390A/1304	624/645
Hitachi CM2085 (1280x1024)	1996
Cornerstone (1600x1280)	1725
Zenith 1490 VGA	620
Packard Bell .....All Models	CALL

• VIDEO CARDS

Mongraphic Card	$35
Paradise EGA (480)	179
Paradise VGA +16	264
VRAM 512K	446
ATI VGA 512K	299
Metheus 1140	CALL
Renaissance RVGA1/II	Special
PixelWorks CA1280-DO8	Special
Cobra 1 B3 1024x800 (256)	Special
Image MGR 1024 2- B3	Special

• F/HARD DRIVE

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ST-225 20 MB	188
ST-251-1, 40 MB 28ms	320
Toshiba MK 134 (44) 25 ms	389
Mitsubishi MR535	389
Micropolis 1335 71 MB	539
Maxtor (4380/8760S/E)	Special
CDC Wren 156	Special
CDC Wren 638	Special
CDC-106 MB/162 MB/385H	Special
Mini-Scribe 3800MB 9380E	1596
Microscience 1090 80 MB	679
Other Brands and Models Not Listed	Call

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WD 1006 MM2	127
WD 1006 SR2	165
WD 7000 Fast ST25 SCSI	335
WD 10007 ESDI WAH/WA2	175/216
Adaptec 1:1 H/F ESDI	237
Adaptec 1:1 H/F RLL	189
Adaptec SCSI	Call
Future Domain	Call

• PRINTERS

Panasonic 1180/1124.	$184/295
Fujitsu DL 3400/5600	536/1259
Okidata 320/321	346/489
Okidata 390/391	489/636
Cannon A50/A65	355/554
Toshiba 351/341SL	899/599
HP Desk Jet+	575/679
HP Laser Jet+ II/IIP.	1595/1025
HP Desk Writer	839
Panasonic Laser 4450	1285
Cannon Laser 811	1750

• POWER SUPPLY & CASES

AT I/O (2S,2P)	$40
AT I/O (2S, 1 P, 1G)	40
Tower Case/Base	198
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Elgar (Power Backup)	Call

• KEYBOARDS & MOUSE

Keytronics 101	$48
Logitech C7 Ser	65
Logitech PS/2	69
Logitech Hi-Res C9 Bus	79

• MODEMS & TAPE BACK-UP

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Telebit T25AA (19200B)	959
U.S.R HST (9600B)	589
Multitech.	Call
Everex 1200/2400 (Int)	72/135
Everex 2400 (Ex)	169
Colorado DJ-10	275
Mountain Tape Back-Up	Call
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DRAM 256-10/8/7
SIMM & SIPP 256K & 1x9/10/8
Co-Processor
287-10, 387-16/20/25/33

• POINT OF SALE

Hardware	Call
Software	Call

• PLOTTERS

H/P 7550A/7475QA	Call
Roland DYX/DPX/GRX	Call
Hitachi	Call
Numonics Series 5500	Call

LAPTOPS

• TOSHIBA

T1000	$597
T1200 HB/FB	1896/1339
T1200H	1705
T1600	2954
T3100E/40MB	2533/3015
T3200/SX	3196/Call
T5100/100 MB	3920/4480
T5200/100 MB	4644/5006

• SHARP

PC-4521	$1760
PC-252M	1889
PC-4602	1265
PC-4641	1915
PC-5541	3629

• NEC

Ultralite 1M/2M	$1835/2269
Prospeed 286	Call
Prospeed 386 40 MB	4058
Prospeed 386 100 MB	4735

• MITSUBISHI

MIT 410	$2271
MIT 409	4791

• EPSON

Epson Equity LT 2 Dr	$1275
Epson Equity LY/20 MB	1889
Epson 286/20 MB	2986
Epson 286/40 MB	3195

• COMPAQ

COMPAQ SLT 286 M20	$3695
COMPAQ SLT 286 M40	3995
COMPAQ III M20	3295
COMPAQ III M40	3895
COMPAQ 386 M40	5295
COMPAQ 386 M100	6495

• ZENITH

SuperSport 184/1	$1385
SuperSport 184/2	2085
SuperSport 286/20	2935
SuperSport 286/40	3239
SuperSport 386/40	4485

• NETWORK HARDWARE

Novell, Gateway, Western,
SMC, SCO, Protean,
Aquila, 3Com, Synoptics

SOFTWARE

ELS Level 1/2	Call
Netware 2.15	Call
Xenix, Unix.	Call

• SCANNERS & DIGITIZERS

Sharp	Call
Chinon DS3000	Call
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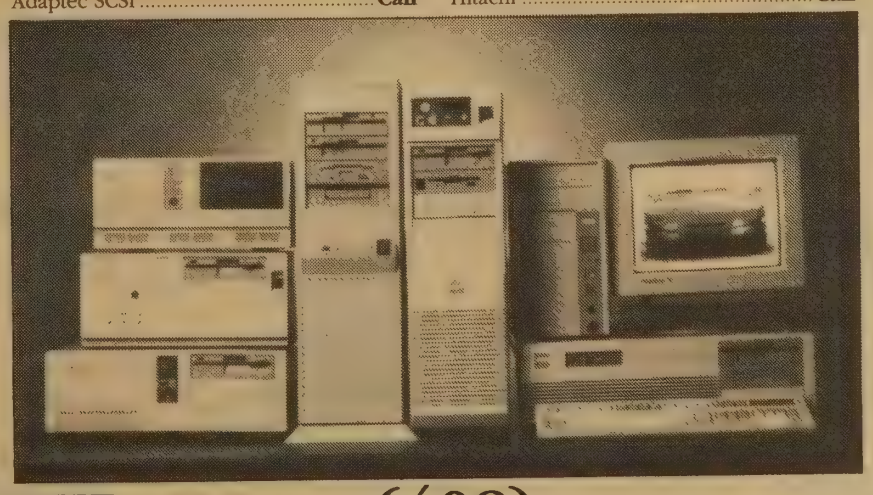
Kurta	335
SummaGraphics.	345
Hitachipuma	355
Hitachitiger	425
Numonics	476



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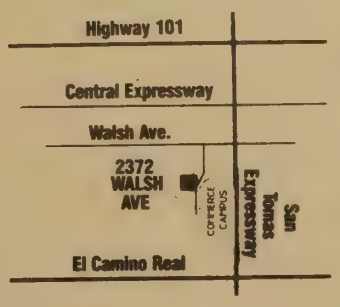

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number (1-800-388-PIR8) to track reports of software piracy throughout the country, and has mounted a massive public awareness campaign to educate users about the legal use of software.

Also in response to member needs, the SPA offers a Data Collection Program, which tracks software sales in 22 categories and nine computer formats, and conducts an annual salary survey for the software industry. It hosts two gatherings a year of PC software executives, and is launching its first European show this year.

WILLIAM E.WETZEL
Director
Venture Capital Network, Inc.
Wetzel's organization offers an informal network for matching entrepreneurs and investors, using an approach not unlike a dating service. In an increasingly tight venture capital market, the organization offers opportunities to startups that might not meet the increasingly demanding criteria of established VC firms but are just right for the smaller—and perhaps more adventurous—investor.

The Third Annual Steve Jobs What's NeXT Award

We're still waiting for David Bunnell's NeXT magazine, last year's winner, which seems to have fallen by the wayside.

This year's award goes to Mitch Kapor, late of Lotus and currently of ON Technology. ON is developing group-oriented information management products for Macintosh, and promises delivery in mid-1990. The company is quite close-mouthed. Kapor is the kind of person the industry just naturally expects spectacular products and ideas from.

We can't wait.

JOHN YOUNG
President and CEO
Hewlett-Packard
Hewlett-Packard celebrated its fiftieth anniversary in 1989 with a triumphant look back to the proverbial garage of founders David Packard and William Hewlett, whose oscilloscope was the beginning of high-tech in the Valley. At the Interex conference in San Francisco, Young reviewed the company's history of delivering business and technical solutions in a variety of fields (interesting fact: the LaserJet printer, with well over a million units shipped, is H-P's all-time bestseller), and conjured up visions of a future that included practical applications of such relatively far-out concepts as multimedia and virtual reality.

During 1989 H-P positioned itself for the UNIX workstation wars ahead by acquiring Apollo Computer. It also continued to develop and enhance its mini, micro, and network systems and applications. Looking toward the future, H-P is developing the Cooperative Computing Environment, which allows networks of general- and special-purpose computers to work together as a single integrated network, regardless of location, manufacturer, or operating system—with a user-friendly, consistent interface and artificial intelligence "agents" to perform routine tasks.

Zaibatsu A Go-Go

The Kleiner-Perkins Touch

Why, you might ask, did Lotus's Jim Manzi suddenly get the UNIX religion in 1989 and announce a strategic alliance with Sun Microsystems? Why, you might also wonder, did Lotus, best known as a spreadsheet vendor, suddenly acquire an equity interest in a little-known and not-yet-public relational database company called Sybase? And why did a startup called NetFRAME unveil its product with a ready sales outlet in Businessland and strategic alliances with a host of software vendors, including the selfsame Sybase?

The reasons are probably legion. But what all these companies have in common is substantial investment by leading venture capital firm Kleiner Perkins Caufield and Byers, and these 1989 announcements are just the latest in a series that began when Businessland launched Compaq computers and 1-2-3 software. KPCB is a strong believer in the Japanese zaibatsu concept, in which companies in interrelated fields banded together for mutual benefit, eventually becoming huge conglomerates of highly interdependent firms. As the company states, "KPCB portfolio companies are autonomous, independent entities. They often sell products to each other, and collaboration can go beyond ordinary vendor/customer transactions. The point of the Network is to encourage the independent ventures to accelerate growth and reduce risk while acting in their self-interest."

A graph showing such alliances among KPCB companies would probably resemble the Gordian Knot. The relationships can take many forms—witness the departure of Bernie Lacroute from Sun Microsystems and reappearance at the helm of KPCB startup Dynabook. Or Enzo Torresi's exit from Businessland, only to reemerge at NetFRAME.

While this approach to doing business is a key factor in the remarkable success of KPCB, things aren't always this rosy. Prisma, for instance, a Kleiner-Perkins startup, vanished from the face of the earth last year. And there are squabbles in the best of families—witness the falling-out between former sweethearts Compaq and Businessland over the EISA standard.

RITA ZOKAEI
Founder
Women's Computer Society
For years Rita Zokaei has been sending us lots of information from the Silicon Valley Computer Society. Well, all that user group activity seems to have given her a good idea.

In the fall of 1989, Zokaei launched the Women's Computer Society, a nonprofit organization designed to increase the computer literacy of women of all ages. She went straight to women in the industry and for the founding meeting had participants from dozens of leading companies. Several meetings have already been held as word of the group's existence continues to spread, and plans are afoot for activities ranging from general networking to educational outreach. ■

Trends And Patterns

Well, this year's list reflects some significant trends in the industry. The number of UNIX hardware and software vendors on the list nearly doubled, and portable and networking vendors did even better.

Reflecting one of our less positive trends, we find a lot more people engaged in the fight against viruses this year, indicating a burgeoning virus problem.

But we rejoice to report that the number of women on the list increase, and we hope to see that trend continue.

	1988	1989
Women	5	7
Virus Fighters	2	4
UNIX Hardware/Software Vendors	15	28
Portable Computer Hardware/Software Vendors	4	11
Executives In Japanese-Owned Companies	2	4
Networking Hardware/ Software Vendors	3	10

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* Supports DOS, OS/2, UNIX, XENIX

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386 25 MHz

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* 1.2 MB Floppy Drive
* 1:1 Interleave Hard/Floppy Disk Controller
* Socket for 80387 Math Co-Processor
* Real Time Clock/CMOS Memory
* 230 W. Power Supply
* 101 Enhanced Keyboard
* EMS; LIM 4.0
* Supports DOS, OS/2, UNIX, XENIX

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386 20 MHz

* Landmark = 25
* 1 MB RAM On Board, Exp to 8 MB
* 1.2 MB Floppy Drive
* 1:1 Interleave Hard/Floppy Disk Controller
* Socket for 80387 Math Co-Processor
* Real Time Clock/CMOS Memory
* 230 W. Power Supply
* 101 Enhanced Keyboard
* EMS; LIM 4.0
* Supports DOS, OS/2, UNIX, XENIX

$1045

386-SX 16 MHz

* Landmark = 21.6
* 1 MB RAM On Board, Exp to 2 MB
* 1.2 MB Floppy Drive
* 1:1 Interleave Hard/Floppy Disk Controller
* Socket for 80387 Math Co-Processor
* Real Time Clock/CMOS Memory
* 230 W. Power Supply
* 101 Enhanced Keyboard
* Supports DOS, OS/2, UNIX, XENIX

$799

286 12 MHz

* Landmark = 15.6
* 512 K RAM On Board, Exp to 1 MB
* 1.2 MB Floppy Drive
* Hard/Floppy Disk Controller
* Real Time Clock/CMOS Memory
* 230 W Power Supply
* 101 Enhanced Keyboard
* Supports DOS, OS/2, UNIX, XENIX

$499

8088 10 MHz

* Landmark = 12.6
* 256K RAM On Board, Exp to 640K
* 360 K Floppy Drive
* Floppy Drive Controller
* 84 Key Keyboard
* 150 W Power Supply
* Supports DOS, OS/2, UNIX, XENIX

$289

Fl. & Hard Disk Contr.

• Floppy Controller 360/720	$17
• Fl. Contr. 360/720/12/144	35
• XT HD Cont. MFM/RLL	50/60
• AT FD & HD Contr. MFM	89
• DTC 7280 (1 to 1 MFM)	99
• DTC 7287 (1 to 1 RLL)	129

Floppy Drives

• Mitsumi 360 KB/1.2 MB	$57/72
• Teac 360 KB/1.2 MB	62/74
• Teac 3.5″ 720KB/1.44 MB	68/78
• Toshiba 3.5″ 720KB/1.44 MB	68/78

Maxtor Hard Disks

• XT-1085, 72 MB, 26ms	CALL
• XT-1140, 120 MB, 25ms	CALL
• XT-2190, 160 MB, 26ms	CALL
• XT-4170, 158 MB, 14ms	CALL
• XT-4380, 338 MB, 16ms	CALL
• XT-8760, 677 MB, 16ms	CALL

Seagate Hard Disks

• ST-225	$195
• ST-225 Kit	245
• ST-238	215
• ST-238 Kit	265
• ST-251-1 (40 MB, 28ms)	315
• ST-277R-1 (60 MB, 28ms)	375

Monitors

• 12″ Amber	$68
• 14″ Mono	95
• Color RGB/EGA	195/310
• Nanao 8060S	545
• Nanao 9070S	940
• NEC Multisync 3D	599
• Multisync	425
• VGA Monitor	340

Video Cards

• Monographics Printer Card	$29
• Color Graphic Card/P	39
• Everex EGA Micro Enhancer	CALL
• Everex EGA Micro Enhancer Deluxe	CALL
• Genoa Super EGA Card	CALL
• ATI/16	220
• ATI/Small Wonder	180
• Video 8/16	180
• Paradise Professional	CALL
• Ahead VGA 16	149

Modems

• 1200 Baud Modem Int/Ext	$57/65
• 2400 Baud Modem Int/Ext	81/99
• Everex Internal 1200/2400	57/125

Misc.

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Network Cards

• 16 Bit Arcnet Card	$164
• 8 Bit Arcnet Card	72
• 16 Bit Ethernet Card	257
• 8 Bit Ethernet Card	160
• Hubs	CALL

Mouse

• Logitech C-7 Serial/Bus	$59
• Logitech C-9 Serial/Bus	69
• Link Serial	29

Printers

• Laser Printers	CALL
• Star NX2400	290
• Star NX 1000	163
• Star NX1000 Rainbow	215
• Panasonic 1191	218
• Panasonic 1180	175
• Panasonic 1124	298

• Mitsumi 101 Keyboard	$39
• Keytronic 101 Keyboard	48
• 5060 84 key Keyboard	35
• Enhanced 101 Click Keyboard	39

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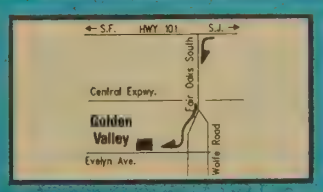

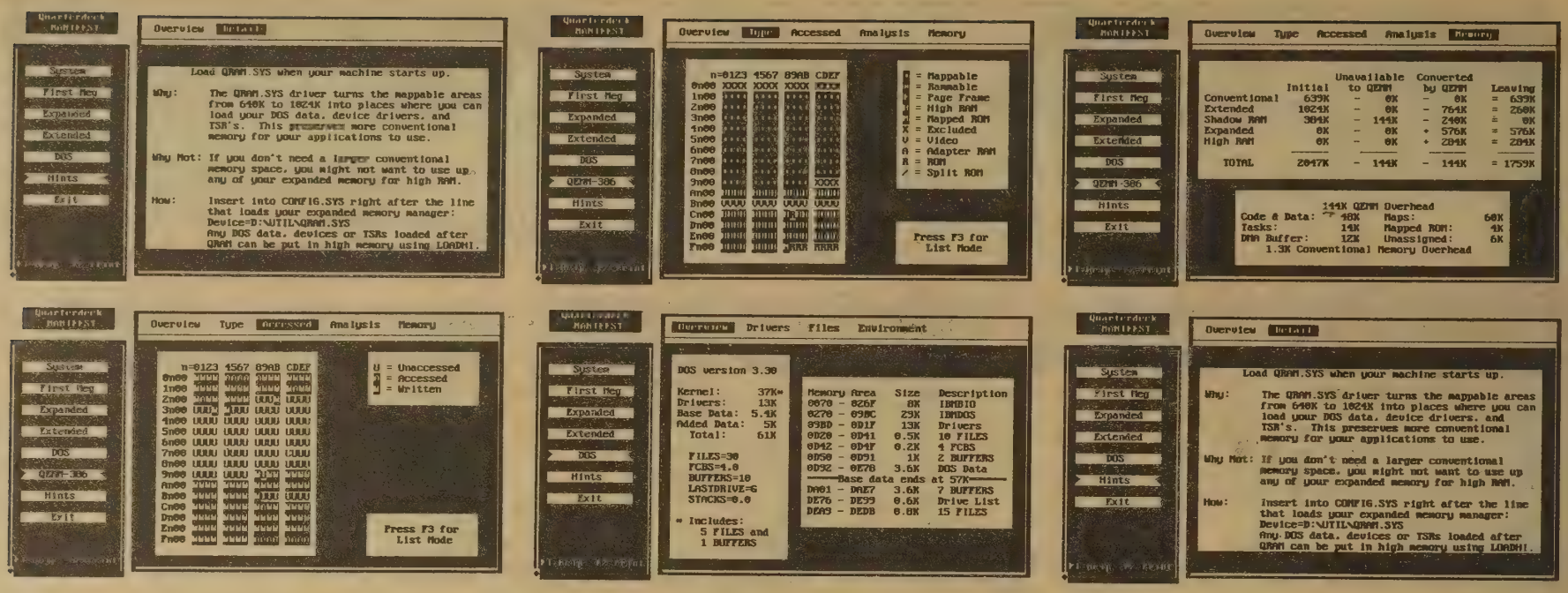
Quarterdeck MANIFEST
System
First Meg
Expanded
Extended
DOS
QEMM-386
Hints
Exit
Overview Detail
Load QRAM.SYS when your machine starts up.
Why: The QRAM.SYS driver turns the mappable areas from 640K to 1024K into places where you can load your DOS data, device drivers, and TSR's. This preserves more conventional memory for your applications to use.
Why Not: If you don't need a larger conventional memory space, you might not want to use up any of your expanded memory for high RAM.
How: Insert into CONFIG.SYS right after the line that loads your expanded memory manager:
Device=D:\UTIL\QRAM.SYS
Any DOS data, devices or TSRs loaded after QRAM can be put in high memory using LOADHI.
Overview Type Accessed Analysis Memory
n=0123 4567 89AB CDEF
M = Mappable
R = Ramable
F = Page Frame
H = High RAM
E = Mapped ROM
X = Excluded
V = Video
A = Adapter RAM
R = ROM
/ = Split ROM
Press F3 for List Mode
Overview Type Accessed Analysis Memory
Unavailable Converted
Initial to QEMM by QEMM Leaving
Conventional 639K - 0K - 0K = 639K
Extended 1024K - 0K - 764K = 260K
Shadow RAM 384K - 144K - 240K = 0K
Expanded 0K - 0K + 576K = 576K
High RAM 0K - 0K + 284K = 284K
TOTAL 2047K - 144K - 144K = 1759K
144K QEMM Overhead
Code & Data: 48K Maps: 60K
Tasks: 14K Mapped ROM: 4K
DMA Buffer: 12K Unassigned: 6K
1.3K Conventional Memory Overhead
Overview Type Accessed Analysis Memory
U = Unaccessed
A = Accessed
W = Written
Press F3 for List Mode
Overview Drivers Files Environment
DOS version 3.30
Kernel: 37K*
Drivers: 13K
Base Data: 5.4K
Added Data: 5K
Total: 61K
FILES=30
FCBS=4.0
BUFFERS=10
LASTDRIVE=G
STACKS=0,0
* Includes:
5 FILES and
1 BUFFERS
Memory Area Size Description
0070 - 026F 8K IBMBIO
0270 - 098C 29K IBMDOS
09BD - 0D1F 13K Drivers
0D20 - 0D41 0.5K 10 FILES
0D42 - 0D4F 0.2K 4 FCBS
0D50 - 0D91 1K 2 BUFFERS
0D92 - 0E78 3.6K DOS Data
Base data ends at 57K
0A01 - 0AE7 3.6K 7 BUFFERS
0E76 - 0E99 0.6K Drive List
0EA9 - 0EDB 0.8K 15 FILES
Overview Detail
Load QRAM.SYS when your machine starts up.
Why: The QRAM.SYS driver turns the mappable areas from 640K to 1024K into places where you can load your DOS data, device drivers, and TSR's. This preserves more conventional memory for your applications to use.
Why Not: If you don't need a larger conventional memory space, you might not want to use up any of your expanded memory for high RAM.
How: Insert into CONFIG.SYS right after the line that loads your expanded memory manager:
Device=D:\UTIL\QRAM.SYS
Any DOS data, devices or TSRs loaded after QRAM can be put in high memory using LOADHI.

Quarterdeck's Manifest utility offers helpful tools for understanding and fine-tuning your PC's memory usage.

Multitasking With DESQview: Part 2

New Memory Management Products From Quarterdeck

By Lenny Bailes

Last installment we talked about making hardware choices for multitasking with *DESQview* and MS-DOS computers. We surveyed the various expanded memory options available for 80286 machines. We might conclude that survey now by noting that if you want to run MS-DOS software in more than 640 K, life is much simpler with a 386.

In the past several months 386SX systems have exploded onto the marketplace. Dealers are offering 386SX one-megabyte machines for $1250 to $1500, including fast hard disks and monitors. For anyone starting from scratch, I believe these systems will rapidly replace 286 clones. For relatively little additional expense, you get a system that's much easier to upgrade for expanded memory. You don't need an EMS board or an All Chargecard with a 386SX; you just plug some more chips into the motherboard, and good memory management software takes care of the rest.

Notwithstanding this fact, Quarterdeck Office Systems continues to support 80286 and 8088 systems with its new series of memory management products. As many user options as possible have been transferred downward from the 386 environment for owners of earlier PCs.

The focus of Quarterdeck's new products is providing more memory for PC users to run applications under DOS. Many people who use special system drivers and pop-up utilities find that 20-200 K of conventional DOS memory is gobbled up before they even get to the C> prompt. We saw in our last installment (*MicroTimes* #62) that *DESQview* can use expanded memory to swap large blocks of code in and out of what remains of conventional memory. Mouse drivers and TSR system-enhancers do not lend themselves to this treatment. DOS must be able to call on these files independently, outside of *DESQview*.

New Memory Products

In addition to *DESQview*, Quarterdeck has now developed a supplementary method for wringing memory out of our PCs for DOS. They've exploited the fact that DOS was written to recognize not 640 K, but a full megabyte of system memory.

Traditionally, PCs are not hardwired to take advantage of DOS's full one-megabyte address capability. The original IBM plan called for the 640 K 1 Mb area to be filled with ROM chips which would control peripheral devices. Consequently, clone manufacturers simply don't wire RAM chip sockets for this address range. But the 640 K 1 Mb address space (referred to by Quarterdeck as high memory) can be used to map code from expanded memory. This allows pop-up utilities, files and buffer statements to be loaded into or run from high memory by a sophisticated memory management program like *QEMM 386*.

For 8088 and 286 clone users, Quarterdeck has now come up with *QRAM* (pronounced "cram"). *QRAM* is a new product which transfers down the 386's power to "loadhi" (places programs into memory ranges between 640 K and 1 Mb) by mapping from expanded memory. *QRAM* comes with the auxiliary "Files" "Buffers" and "Loadhi" utilities formerly distributed only with *QEMM 386*.

QEMM 50/60 is new memory management software for PS/2 30, and PS/2 50/60 machines, now providing "loadhi" and EMS mapping with any EMS boards designed for PS/2 systems.

Manifest was designed with a dual purpose: to indoctrinate new PC users into the mysteries of PC memory management, and to provide an automatic diagnostic tool for sophisticated users, allowing the source of software memory conflicts to be pinpointed.

QEMM 386, v.5 is new memory management software for 386-compatible machines (including PS/2 70/80 and the 386SX). Besides providing automatic mapping of all memory on the motherboard to LIM 4.0 EMS and "loadhi" capability, *QEMM 386*, v.5 has a series of new features—almost twice as many parameter switches as the previous release. *QEMM*'s new switches are designed to minimize memory conflicts caused by nonstandard hardware and software. *QEMM 386*, v.5 specifically addresses problems with Compaq and Chips and Technologies systems, optionally relocating Compaq's Video ROM, and restoring the 384 K shadow-RAM which Chips and Technologies hides, freeing it for use as extended or expanded memory.

Optimize, a utility distributed with *QRAM*, *QEMM 50/60*, and *QEMM 386*, will analyze your boot files (autoexec.bat and config.sys). *Optimize* tests buffers, files statements, mouse drivers and other TSR utilities by rebooting your machine several times. A new set of configuration files is written which loads as much as possible (even *TOPS* networking software!) into high memory. With previous versions of *QEMM* you had to experiment manually with the "Loadhi" command, crashing and rebooting again and again. *Optimize* now finds the best configuration of memory automatically. *Optimize* works with *QRAM* to bring the same capability to 8088- and 286-compatible machines.

Last but not least, Quarterdeck has invented a definitive status reporting utility called *Manifest*. *Manifest* offers all of the system checkout information available in *PC Tools* or the *Norton Utilities* combined with all of the BBS snoop utilities you've ever downloaded in the middle of the night. *Manifest* has a pleasant user

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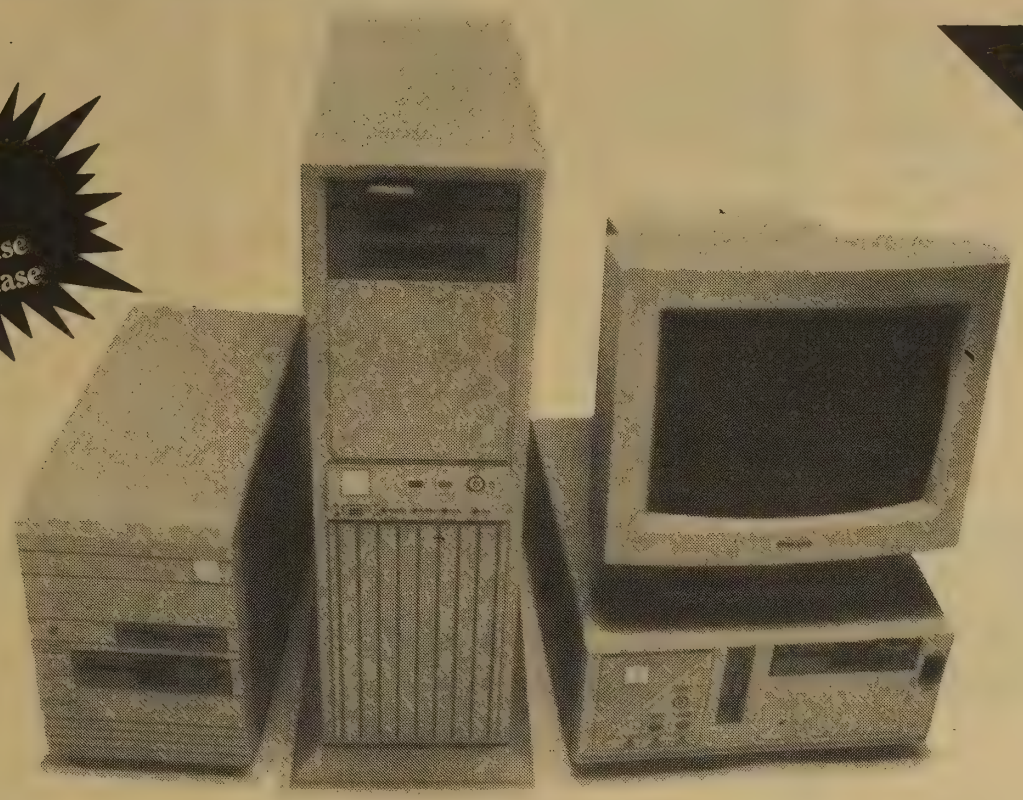

Beyond Computer Systems

Systems:	286/12	286/16	386SX/20	386/20	386/25	Cache 386/25	Cache 386/33
Price:	$530	$600	$770	$1075	$1195	$1480	$2095
CPU:	Intel 80286-12	AMD 80286-16	Intel 80386SX	Intel 80386-20	Intel 80386-25	Intel 80386-25	Intel 80386-33
Coprocessor:	80287 socket	80287 socket	80387SX socket	80387 socket	80387 socket	80387/Weitek	80387/Weitek
Cache Memory:	None	None	Page Mode	Page Mode	Page Mode	64K up to 256K	64K up to 256K
Speed:	12/8 MHz	16/8 MHz	20/10 MHz	20/10 MHz	25/12.5 MHz	25/8 MHz	33/8 MHz
Wait State:	Zero or one	Zero or one	Zero or one	Zero or one	Zero or one	Zero or one	Zero or one
Clock:	YES	YES	YES	YES	YES	YES	Yes
BIOS:	AMI	AMI	AMI	AMI	AMI	AMI	AMI
Memory:	512K up to 4 MB	512K up to 8 MB	1 MB up to 8 MB	1MB up to16 MB	1 MB up to16 MB	1 MB up to16 MB	1MB up to 16MB
Controller:	2:1 interleave	1.1 Interleave	1:1 interleave	1:1 interleave	1:1 interleave	1:1 interleave	1:1 Interleave
Floppy Drive:	1.2 MB	1.2 MB	1.2 MB	1.2 MB	1.2 MB	1.2 MB	1.2 MB
Keyboard:	101 keys	101 keys	101 keys	101 keys	101 keys	101 keys	101 keys
I/O Ports:	2 S/1 P/1 G	2 S/1 P/1 G	2 S/1 P/1 G	2 S/1 P/1 G	2 S/1 P/1 G	2 S/1 P/1 G	2 S/1 P/1 G
Slots:	6/16-bit, 2/8-bit	5/16-bit, 3/8-bit	5/16-bit, 3/8-bit	1/32, 5/16,2/8-bit	1/32,5/16, 2/8-bit	1/32, 5/16, 2/8-bit	1/32,5/16,2/8-bit
Power Supply:	200 Watt	200 Watt	200 Watt	200 Watt	200 Watt	200 Watt	200 Watt
Case:	Mini/Standard	Mini/Standard	Mini/Standard	Mini/Standard	Mini/Standard	Mini/Standard	Mini/Standard

Hard Disk

20 MB, 65 ms, MFM	$190
30 MB, 65 ms, RLL	$205
40 MB, 28 ms, MFM	$319
60 MB, 28 ms, RLL	$389
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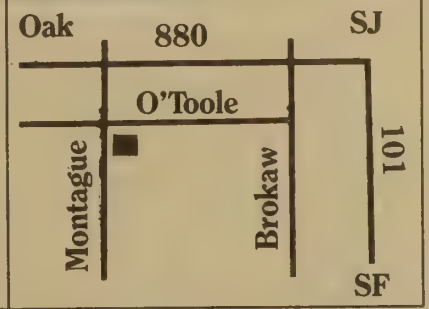

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interface which provides explicit, context-sensitive help. It also performs benchmark tests, provides maps of memory usage and offers tips on how to improve system performance.

Manifest was designed with a dual purpose: to indoctrinate new PC users into the mysteries of PC memory management and to provide an automatic diagnostic tool for sophisticated users, allowing the source of software memory conflicts to be pinpointed. Both *QEMM 386*, v.5 and *Manifest* display graphic maps of memory usage. The maps show how each 4 K segment is used: as program RAM, mappable "Loadhi" area, mappable EMS, reserved video/controller area, or ROM BIOS. Another map lets you see whether any 4 K segment has been read, written to, or ignored by DOS. If you cycle through the applications you typically run in a computing session, you can see exactly which areas of memory have been used and which areas ignored.

Quarterdeck continues to support 80286 and 8088 systems with its new series of memory management products. As many user options as possible have been transferred downward from the 386 environment for owners of earlier PCs.

If your ability to interpret this information is less than expert, *QEMM* will make suggestions directly about including or excluding memory addresses from its own management. *Manifest* may tell you to increase or decrease files and buffers, or to reset parameter switches on your memory management software. Context-sensitive help can be popped up at any time to explain the information in the *Manifest* window. *Manifest* can be run as a TSR and popped up over any text-based application or from within *DESQview* to display really current information on DOS interrupt usage and memory allocation.

Currently, Quarterdeck is bundling *Manifest* with the *QEMM* packages for the 386 and PS/2 and with *QRAM* for 8088- and 286-compatibles. Eventually their plan is to make *Manifest* a standalone product.

Putting QEMM/QRAM To Work

One of the first tips *Manifest* will give you is to run the *Optimize* program. If you put all of your system drivers and TSR utilities into your autoexec.bat and config.sys files, *Optimize* will figure out how to load as many of them as it can into high memory. This is accomplished by rewriting your bootup files to make use of Quarterdeck's "Buffers," "Files," and "Loadhi" utilities.

Let's say your startup files look something like this:

Config.sys

```
DEVICE=QEMM.SYS
EXTMEM=256 RAM
DEVICE=SMARTDRV.SYS 256
DEVICE=HARDRIV.SYS
FILES=60
BUFFERS=20
```

Autoexec.bat

```
Path=C:\DOS;C:\UTIL;C:\WP50
Prompt $p$g
Mouse
Keyrepet
```

You are using *QEMM* on a 386 to convert your extended memory to expanded memory, but also allocating 256 K as extended memory for Microsoft's Smartdrive disk cache (EXTMEM=256). You tell *QEMM* to reserve some memory for "Loadhi" with the RAM parameter. Your hard drive is larger than 32 Mb, so it requires a special device driver called Hardriv.sys. You allocate a standard number of files and buffers. Your autoexec.bat sets path information and a prompt, loads a driver for your mouse and a TSR cursor speed-up utility.

When *Optimize* is run it asks you for permission to reboot your system, then does so twice. When *Optimize* is through, you have two new files called Config.opt and Autoexec.opt. They read as follows:

Config.opt

```
DEVICE=QEMM.SYS AUTO
EXT=256 RAM
DEVICE=LOADHI.SYS /r:1
SMARTDRV.SYS 256
DEVICE=LOADHI.SYS /r:1
HARDRIV.SYS
FILES=60
```

Autoexec.opt

```
PATH=C:\DOS;C:\UTIL;C:\WP50
PROMPT $p$G
LOADHI /r:1 MOUSE
LOADHI /r:2 KEYREPET
LOADHI /r:3 BUFFERS=20
```

Most of your startup files have been set up to run in high memory. CHKDSK now shows you have an additional 40-60 K of memory available for DOS (or a larger *DESQview* window). Notice that the buffers have been taken out of the config.sys and loaded high in the autoexec.bat. If you run *Manifest* again it may make further suggestions, such as "Reduce the number of files in the config.sys (You don't need 60)." The "r:" statements have to do with which areas of high memory should be used first by "Loadhi."

Bugs

QEMM 386, v.5 has some small syntax differences from the previous version in its command line parameters. If you use the automatic install program, you must be careful to notice these changes. (The new version requires that the command to disable the EMS pageframe be FR=NONE, instead of simply NONE, as with QEMM v.4.23). The install program also doesn't always faithfully copy all of the chosen command line parameters to the new config.sys file. It may forget to write the "FR=" in front of the "NONE" because the previous version didn't require this.

Quarterdeck warns you that the suggested tips provided by *QEMM* and *Manifest* may not always optimize performance on your individual system. In one case *QEMM* told me to include an area claimed by the ROM BIOS as mappable high memory (evidently because no application wrote to that area during the time I tested it). After including that BIOS area (FB00-FBff) I later had some keyboard difficulties and had to exclude it again.

If you want to run MS-DOS software in more than 640 K, life is much simpler with a 386. Dealers are offering 386SX one-megabyte machines for $1250 to $1500; for anyone starting from scratch, these systems are a better choice than 286 clones.

I found most of the recommendations offered by the software's diagnostics to be useful and to improve performance. As of this writing, Quarterdeck is still fine tuning these products for December release, and these bugs may be gone by the time you read this.

Optimize, *QRAM* and QEMM can also be used to load local area network drivers into high memory (see accompanying sidebar).

Quarterdeck's new products were expected to ship in mid-December. Purchasers of QEMM products between August 21 and the release date will be entitled to an upgrade for $20. *QEMM 50/60* users enrolled in Quarterdeck's Priority Support Program can upgrade to *QEMM* 5.0 for $20.

Help With Problem-Solving

Most PC applications can be made to coexist inside of *DESQview*. To resolve individual software/hardware problems, Quarterdeck maintains a BBS, a technical support telephone line, and a priority service support line. The BBS and telephone support are free to registered users of Quarterdeck products. Competition on the free telephone line can be intense, but once you get through, the tech support people are very likely to resolve your conflicts. Quarterdeck's support people are unique in their sophistication and knowledge of the PC environment.

Because of the diversity of standards in PC programming, sometimes a little juggling is required. *DESQview* and *QEMM 386* can be modified with many user-adjustable performance settings. Most potential conflicts are resolved automatically by a series of preset application startup files. These are similar to the Program Information Files distributed with Microsoft Windows.

With hardcore *DESQview* users, experimenting with configuration settings for ill-behaved programs can become an addiction like solving crossword puzzles. These solutions are often shared among other *DESQview* users. In addition to Quarterdeck's bulletin board and tech support line, there is an active network of *DESQview* users which communicates through a national conference. The *DESQview* conference is carried by hobbyist BBS systems in many North American cities over SMARTNET. This is a free and accessible source of information where most of the questions anyone would ever ask about *DESQview* are posted and replied to repeatedly by real-world users committed to a problem-free environment.

—Lenny Bailes

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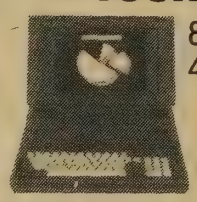
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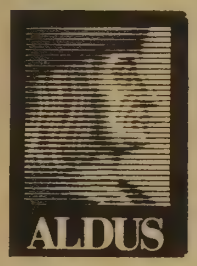

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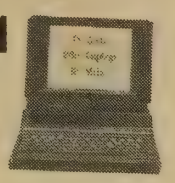

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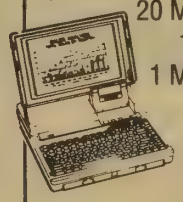

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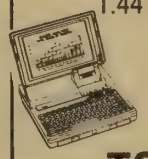

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Registered users of *QEMM* v.4 can upgrade for $30. (*QEMM 386*, v.5 ($99.95), QEMM 50/60, *QRAM* ($79.95), *Manifest* ($59.95) from Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405, 213/392-9701. *Manifest* is currently also bundled with the *QEMM 386*, *QEMM 50/60* and *QRAM* packages.) ■

Copyright © 1990 by Lenny Bailes. All rights reserved. *Lenny Bailes is a teacher in the Bay Area, and has been writing about personal computers since 1987. He does part-time consulting and product testing, and can be reached on The WELL (415/332-6106) as "jroe" or at (415)285-6232.*

TOPS And DESQview On A File Server

One result of my crossword-like fiddling with Quarterdeck's memory management was a discovery that TOPS network software and *DESQview* can be run concurrently on a 386 file server. Quarterdeck does not recommend running *DESQview* from a network server, but they do support it on client machines. Usually, when you run *DESQview* on a server things start acting unpredictably or the system crashes very shortly.

A technical tip from the All Computer Company, which makes the 286 Chargecard, gave me some missing clues to solve this particular puzzle. The All Company documents that *TOPS* runs successfully with their product if the EMS memory manager's pageframe is disabled.

When EMS memory management is run with no pageframe, the result is to disable usage of the LIM 3.2 EMS standard for programs like Lotus *1-2-3*, *Framework*, etc. LIM 4.0 applications do not use the pageframe (see *MicroTimes* #62 for further discussion of EMS managers and pageframes). Treating other programs as its own data, *DESQview* continues to multitask most applications with no pageframe requirement under *QEMM 386*.

TOPS is initiated on a PC by running a batch file of four network driver commands. To run both *DESQview* and *TOPS* I added the FR=NONE switch to QEMM.SYS in the would-be server's config.sys file. After rebooting and running the *TOPS* batch file, I opened a DOS window under *DESQview*. I published a volume from the PC, making the machine a server. Instead of crashing as usual, *TOPS* did its job. I opened a *WordPerfect* window and started a print job.

While *WordPerfect* was busy, I walked over to a Macintosh on the *TOPS* network. I copied *PageMaker* onto the PC hard disk. I then opened *PageMaker* from the Mac, running it on the shared PC hard disk. *WordPerfect* continued to function normally while I opened another DOS window in *DESQview* on the PC. All applications on both systems continued to work. After several hours without a crash I began to believe that I was on to something here.

But say—why run *TOPS* in the PC's conventional memory, leaving only 450 K for *DESQview*? I copied the *TOPS* batch file to my autoexec.bat, added the "RAM" parameter to *QEMM 386* and ran Quarterdeck's new *Optimize* utility. *Optimize* rewrote my autoexec.bat to load all of the *TOPS* files into high memory.

I edited the new autoexec.bat to restore the first *TOPS* module (ALAP) to conventional memory. (You ask why? Because the documentation from All Computers warned me to do this if I was "loading high" with "their" software.)

After running *Optimize* and following the tip from the All Computer Company, my bootup files now looked like this:

Config.Sys

```
DEVICE=QEMM.SYS FR=NONE RAM
STACKS=0,0
DEVICE=C:\LOADHI.SYS /r:1 MOUSE.SYS
FILES=30
BUFFERS=1
```

Autoexec.bat

Rewritten TOPS.BAT

```
PROMPT=$P$G
PATH=C:\DOS;C:\UTIL;C:\WP;C:\TOPS;
ALAP DMA=NONE /INT=60
C:\LOADHI /r:1 PSTACK
C:\LOADHI /r:2 TOPSTALK
C:\LOADHI /r:3 TOPSKRNL
C:\LOADHI /r:4 BUFFERS=20
```

When the cursor was settled at the C> prompt, I was able to publish volumes under *TOPS*. CHKDSK still said I had 594 K of conventional memory available! I repeated the tests with *DESQview*, *WordPerfect* 5.0 and *PageMaker* from the Mac Client. The office I did this trick for is still running that configuration.

—Lenny Bailes

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—William Gibson, Neuromancer

Being In Nothingness

Virtual Reality And The Pioneers Of Cyberspace

By John Perry Barlow

Suddenly I don't have a body anymore.

All that remains of the aging shambles which usually constitutes my corporeal self is a glowing, golden hand floating before me like Macbeth's dagger. I point my finger and drift down its length to the bookshelf on the office wall.

I try to grab a book but my hand passes through it.

"Make a fist inside the book and you'll have it," says my invisible guide.

I do, and when I move my hand again, the book remains embedded in it. I open my hand and withdraw it. The book remains suspended above the shelf.

I look up. Above me I can see the framework of red girders which supports the walls of the office...above them the blue-blackness of space. The office has no ceiling, but it hardly needs one. There's never any weather here.

I point up and begin my ascent, passing right through one of the overhead beams on my way up. Several hundred feet above the office, I look down. It sits in the middle of a little island in space. How very like the future this place might be: a tiny world just big enough to support the cubicle of one Knowledge Worker. I feel a wave of loneliness and head back down. But I'm going too fast. I plunge right on through the office floor and into the bottomless indigo below. Suddenly I can't remember how to stop and turn around. Do I point behind myself? Do I have to turn around before I can point? I flip into brain fugue.

"Just relax," says my guide in her cool clinical voice. "Point straight up and open your hand when you get where you want to be."

Sure. But how can you get where you want to be when you're coming from nowhere at all?

And I don't seem to have a location exactly. In this pulsating new landscape, I've been reduced to a point of view. The whole subject of "me" yawns into a chasm of interesting questions.

At least I know where I left my body. It's in a room called Cyberia in a building called Autodesk in a town called Sausalito, California. But I—or "I"—am in cyberspace, a universe churned up from computer code by a Compaq 386 and a pair of Matrox graphics boards, then fed into my rods and cones by VPL Eyephones, a set of

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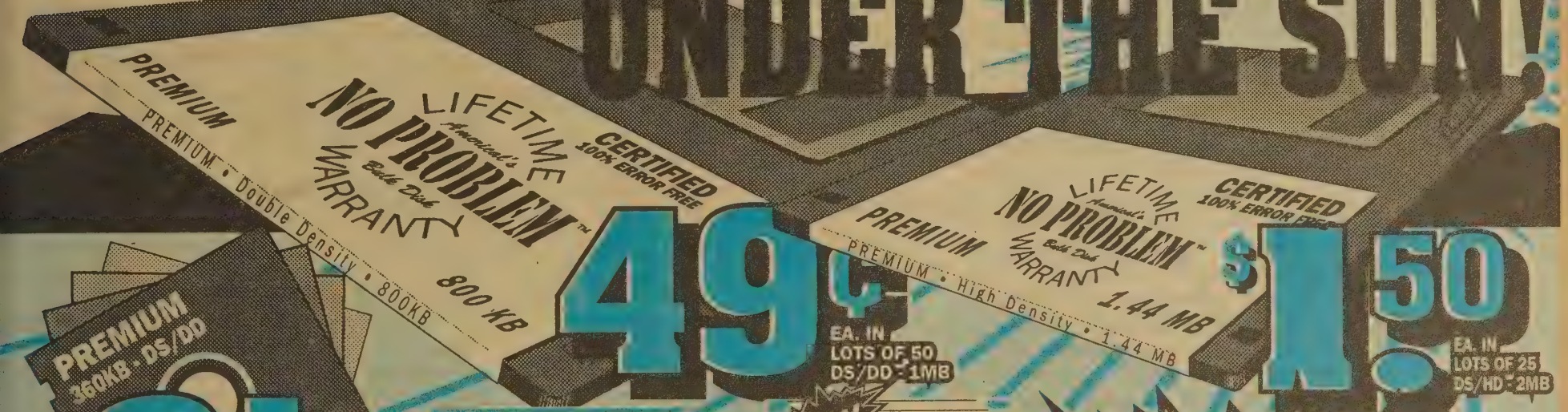
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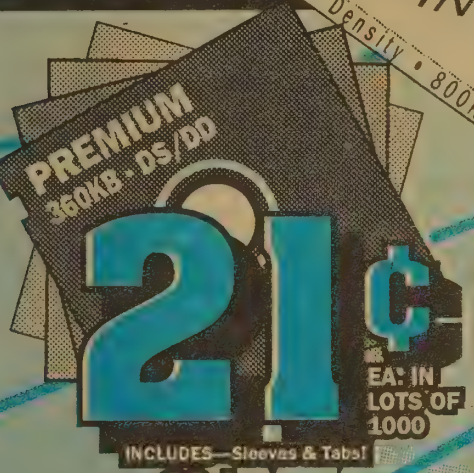

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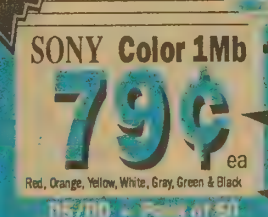

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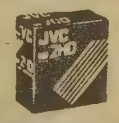

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goggles through whose twin, parallax-corrected video screens I see this new world.

When I move my head, the motion is tracked by a Polhemus magnetic sensor, and the imaging engine of cyberspace is instructed to alter what I see accordingly. Thus, having made a controlled ascent back up through the floor of the "office," I turn to the left and I see a red chair with a desk behind it. I turn to the right and I see a door leading out onto the floating platform.

The configuration and position of my right hand are fed into the system by a VPL DataGlove, also with a Polhemus attached to it. The relationship between my hand and the Eyephones is precisely measured by the two tracking devices so that my hand appears where I'd expect it to. When I point or make a fist, the DataGlove's fiber optics convert kinesthetics into electronics. For a decisecond or so, my hand disappears and then reappears, glowing and toon-like, in the appropriate shape.

Despite the current confines of my little office-island, I know that I have become a traveler in a realm which will be ultimately bounded only by human imagination, a world without any of the usual limits of geography, growth, carrying capacity, density or ownership. In this magic theater, there's no gravity, no Second Law of Thermodynamics, indeed, no laws at all beyond those imposed by computer processing speed—and given the accelerating capacity of that constraint, this universe will probably expand faster than the one I'm used to.

Welcome to Virtual Reality.

The Next Big Thing: Money From Nuthin'

"I think this is the biggest thing since we landed on the Moon," says Jaron Lanier, the dreadlocked CEO of VPL Research (who was nine years old at the time). I don't choke on that one. Indeed, I'd take it a bit farther, guessing that Columbus was probably the last person to behold so much usable and unclaimed real estate (or unreal estate) as these cybernauts have discovered.

Neil Armstrong's small step ran about 70 billion real dollars, but when John Walker, the Hacker King of Autodesk, committed his company to creating the first commercially-available "world in a can," he figured that the prototype "gizmo" could be built for about $25,000.

VPL, the other trading post on the VR frontier, isn't much fatter, although internal synergy seems to magnify output. Since their incorporation in 1985, they've had two *Scientific American* covers and produced the DataGlove, DataSuit, the PowerGlove, Swivel 3-D and the only commercially available eyephones. They've been in a couple of big lawsuits (one, just concluded to their satisfaction, with Stanford University), and create, at a distance, the mirage of a fair-sized company going at it pretty hard.

But up close, one can get on a first-name basis with every VPL employee in the course of an afternoon. They have yet to outgrow the third floor of their slightly tacky building at the Redwood City yacht harbor.

While Apple's research gazillions yield such dubious fruit as multimedia and the AppleFax Modem, while IBM replicates methods for chaining bureaucrats to its mainframes, it begins to appear that the Next Big Thing will begin its commercial evolution as humbly as the personal computer.

As usual, the Big Guys have neither the means

How many architects have dreamed of the ability to take their clients on a walk inside their drawings before their miscommunications were sealed in mortar? Virtual Reality has already been put to such use at the University of North Carolina, where the new $10 million home of its computer science department was designed by virtual means.

nor the desire to engage in such open-ended creation as settling the virtual universe will require. Like the Union Pacific Railroad awaiting the fact of empire, they prefer to let the rag-tag pioneers die all over the frontier before they come out to claim it. When the Altairs and Osbornes of Virtual Reality have made their fatal errors and are headed for Chapter 11, IBM probably will issue forth the SolutionStation VR Network or some such and accelerate natural selection in the field.

But as I write this, VPL and Autodesk still have it to themselves. Actually, they are not the first to make virtual landfall. They are only the first at financial risk. Unlike the first automobiles or telephones, their commercial fledglings had the advantage of long incubation by government and academia.

A Short History Of Virtual Reality

Virtual Reality, as a concept, found first form at the University of Utah over 20 years ago in the fecund cranium of Ivan E. Sutherland, the godfather of computer graphics and the originator of about every Big Computer Idea not originated by Alan Kay or Doug Engelbart. In 1968, he produced the first head-mounted display. This was the critical element in VR hardware, but it was so heavy that it had to be suspended from the ceiling...at some peril to its wearer. Damocles was mentioned.

Besides, once you got it on, there wasn't much to see in there. There wasn't a computer in existence which could churn out enough polygons per second to simulate a reality much more full-bodied than a game of Pong.

So Virtual Reality passed a generation waiting for the equipment to arrive. In 1985 the Japanese finally (and unintentionally) provided us with the right video displays when NASA's Mike McGreevy happened to notice that the Citizen Watch Co. LCD displays in a Radio Shack mini-TV were small enough to fit two in a head-mounted display.

I hardly need to detail what happened to CPU horsepower during that period. By 1985, graphics engines of appropriate juice were almost within

financial range of entities not involved in the defense of our nation.

Also by this time, NASA had made a strong commitment to VR research, though mostly in the service of "telepresence," the ability to project one's judgment and actions into a robot located some real place you'd rather not be, like space. They were less persuaded by the attractions of unreal places.

The Air Force was also conducting research at Wright-Patterson under the direction of Tom Furness, but most of this was directed at the usual dismal purpose, simplifying the annihilation of non-virtual humans. Heads-up displays and looks that kill were their speciality.

For all this expenditure of tax dollars, Virtual Reality still lacked two critical elements: a sense of whimsy and a fluid, three-dimensional method for "grabbing" and manipulating the furniture of cyberspace. VPL was on the case.

VPL's Tom Zimmerman had always wanted the ability to actually *play* air guitar. It was the sort of desire his "boss," Jaron Lanier, could understand. Jaron had only gotten into computers after concluding that musical composition was not a reliable day job. And his ownership of more than 300 musical instruments might indicate, if nothing else, a probing dissatisfaction with the limits of each one.

By 1984 Zimmerman and others at VPL had created what was called the Z-Glove, a hand with which to strum those invisible strings and the progenitor of the DataGlove. While they were creating this hardware interface (though the Spandex feel of the DataGlove is more like "leisureware interface"), Jaron, Chuck Blanchard and others were writing the software, including Body Electric, which maps the movements of the DataGlove and Eyephones onto the virtual landscape.

The commercial colonization of cyberspace was beginning. VPL's strategy was to build the most powerful simulations current technology would allow, without regard to hardware cost, selling the spin-offs at increasingly affordable prices. One such item, the PowerGlove, is a Nintendo game controller based on the Z-Glove which VPL has licensed to Mattel.

Another VPL spin-off product is Swivel 3-D, odds on the best 3-D modeler for the Macintosh. Young Harvill wrote it as a tool to create an artificial reality quickly and easily on Mac before integrating it into Body Electric and sending it over to the twin Silicon Graphics CPUs which blow it up to full size.

In September of 1988, John Walker wrote an internal Autodesk white paper called *Through the Looking Glass: Beyond "User Interfaces."* In it he proposed an "Autodesk Cyberpunk Initiative" to produce, within 16 months, a doorway into cyberspace—available to anyone with $15,000 and a 386 computer. The project's motto: "Reality Isn't Enough Anymore."

Since NASA's Virtual Realities were running in the millions and VPL's in the middle hundreds of thousands, Walker envisioned a significant discount over previous models, but he knew that his customers, if any, would be more bargain-conscious than, say, the US Air Force.

Autodesk's Cyberia Project was running hard by Christmas, 1988, staffed by William and Meredith Bricken, Eric Gullichsen, Pat Gelband, Eric Lyons, Gary Wells, Randy Walser, and John Lynch. When I arrived on the scene in May, they had been keeping hacker's hours for a long time.

And they were ready to make a product. They'd made a promo video starring Timothy Leary. Gulli-

continued on page 104

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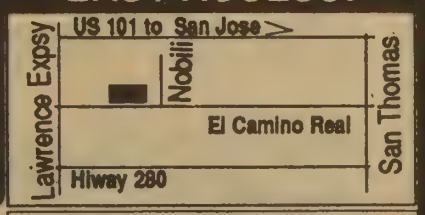

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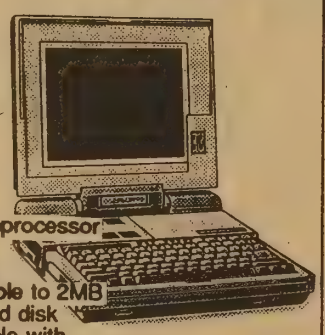

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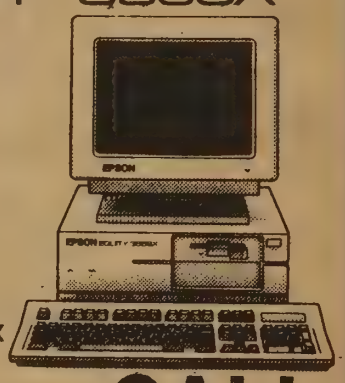

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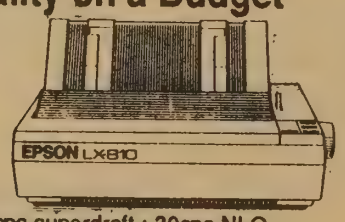

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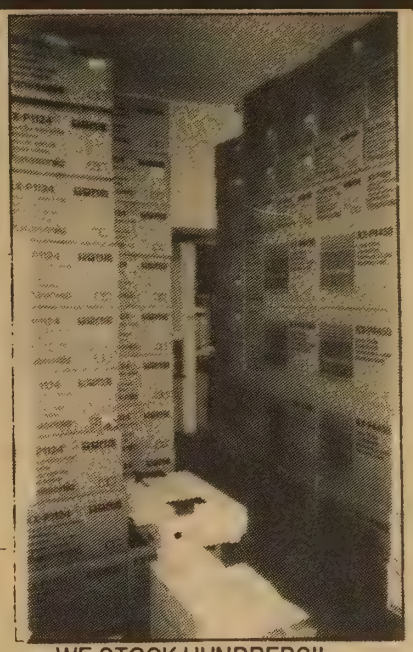

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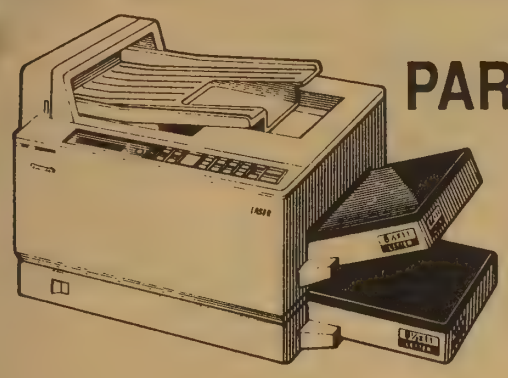

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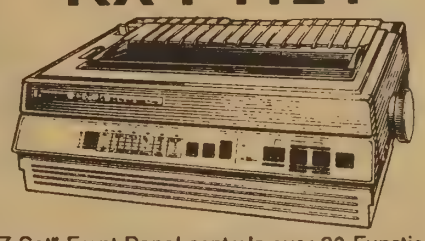

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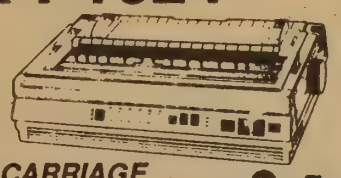

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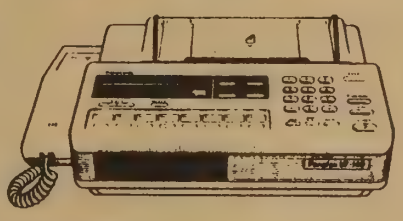

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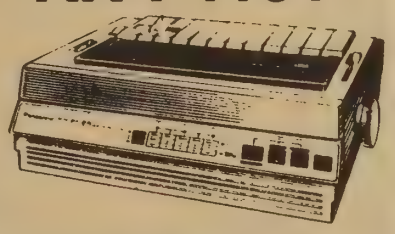

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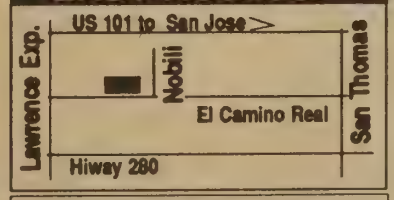

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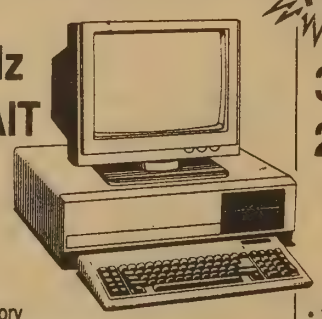

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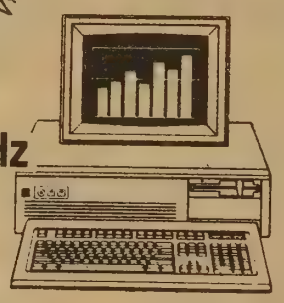

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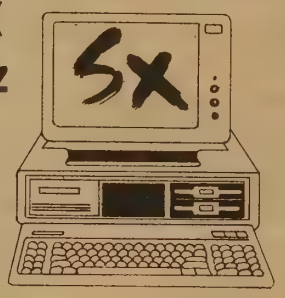

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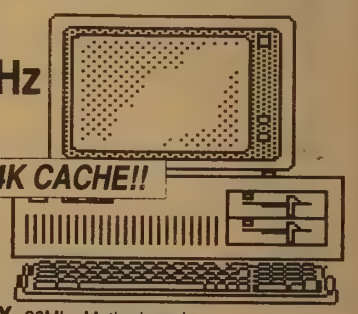

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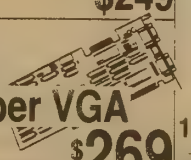

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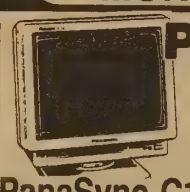

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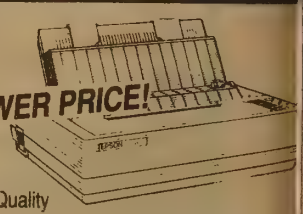

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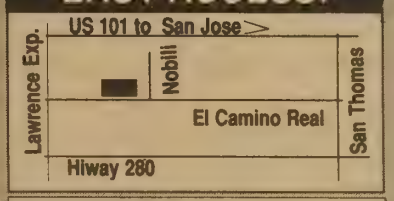

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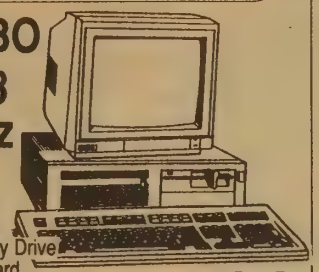

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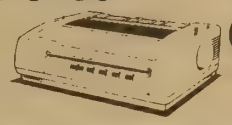

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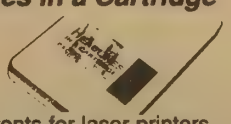

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chsen had even registered William Gibson's term "cyberspace" as an Autodesk trademark, prompting an irritated Gibson to apply for trademark registration of the term "Eric Gullichsen." By June, they had an implementation which, though clearly the Kitty Hawk version of the technology, endowed people with an instantaneous vision of the Concorde level.

Meanwhile, back in the real world, things were getting complicated. While everyone who went to Autodesk's Cyberia agreed that Virtual Reality was *something*, there was less agreement as to *what*. When something has endless possibilities, each of them is liable to dilute down to a point where people start to say things like, "Sure, but what's it really *good* for?" The presence of such unclaimed vastness seems to elicit territorial impulses from psychic regions too old to recognize the true infinity of this new frontier. Disputes appeared like toadstools in the rich new soil of cyberspace.

Thus, by mid-November, the Autodesk half of the Next Big Thing was down to one full-time hacker: Randy Walser. The Brickens had headed to Seattle to join Tom Furness in a (non-lethal) VR research program at the University of Washington. Eric Gullichsen and Pat Gelband had formed their own VR company, Sense 8.

Still, everyone realized that a baby this size would be bound to occasion some labor pains. As the general media began to pick up on Virtual Reality, its midwives were preparing themselves for interesting times. It would be worth it. But *why?*

To the people who will actually make the future, such a question is beside the point. They will develop cyberspace because, like Mallory's mountain, it's there. Sort of.

But What's It Good For?

There are some practical reasons for the settlement of cyberspace. They aren't as much fun to think about as the impractical ones, but they exist. First among them is that this is the next logical step in the quest to eliminate the interface—the mind-machine information barrier.

Over the last 20 years, our relations with these magic boxes have become intimate at a rate matched only by the accelerating speed of their processors. From the brutal austerity of batch-processed punch-cards to the snuggly Macintosh, the interface has become far less cryptic and far more interactive.

There have remained some apparently unbreachable barriers between us and the CPU. The thin alphanumeric stream which drips from our fingertips and into the computer is a pale reflection of the thoughts which produce it, arriving before the CPU at a pace absurdly mismatched to its chewing/spitting capacities.

Then there is the screen itself. While a vast improvement on the flickering LEDs of the Altair or even the amber text of DOS, the metaphorical desktop remains flat as paper. There is none of the depth or actual spatiality of experience.

After we get past what few documents we can keep on the screen at one time, we are back to the alphabetized hierarchy. We can't pile it, as most of us tend to do in real life. We have to file it. And this is not the way the mind stores information. One doesn't remember the names of his friends alphabetically. When looking for a phrase in a book, you are more likely to look for its spatial position on the page than its intellectual position in context.

The actual operation of human memory works on a model more like the one St. Thomas Aquinas used. Aquinas, who carried around in his head almost all the established knowledge of his simpler world, is said to have imagined a mind-castle with many different rooms in which varying kinds of ideas dwelled. The floorplan increased with his knowledge.

Nicholas Negroponte recreated a modest version of Aquinas's castle in the 70's. He came up with a virtual office, represented in cartoon form on the screen. One could mouse around to the "piles" of "paper" stacked on the "desk" or "filing cabinet," leafing through them not by the first letter of their subject name but by their archaeological layer of deposition.

The problem was the screen. Negroponte created a flat picture of an office rather than something more like the real thing because that was all one could display on a screen. In two dimensions, the image of desktop seemed a lot more natural than the image of the desk. Thence the Macintosh.

I used to think that the only way around these narrow I/O apertures lay in such heroic solutions as brain implants. I think I was about 14 when it occurred to me that this was the answer. Brain surgery seemed a minor nuisance if it left one with the ability to remember *everything*.

I suppose I'd still be willing to put a Cray in my cranium, but my faith in technology has moderated since early adolescence. I'm more comfortable with the possibility of an interface which fills the gap between keyboarding and neurological hardwiring and involves no cortical knife-play. Virtual Reality is almost certainly that.

Autodesk's John Walker puts it this way, "If

continued on page 118

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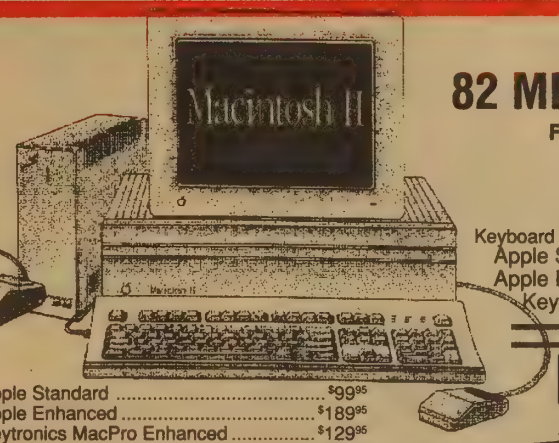

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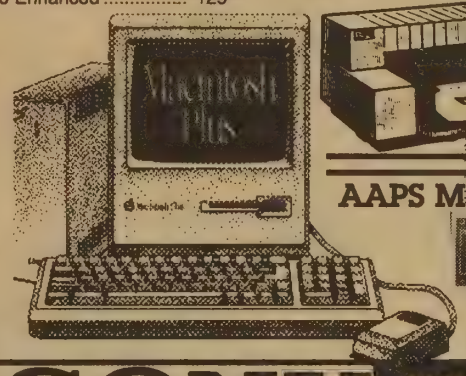

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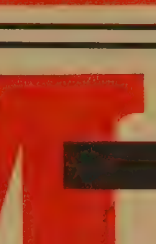

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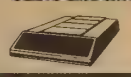

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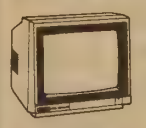

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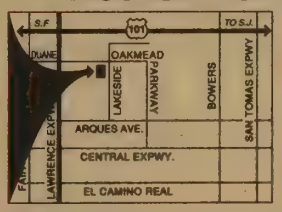

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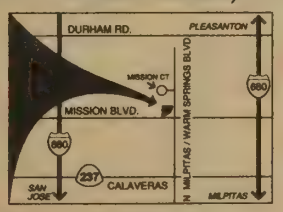

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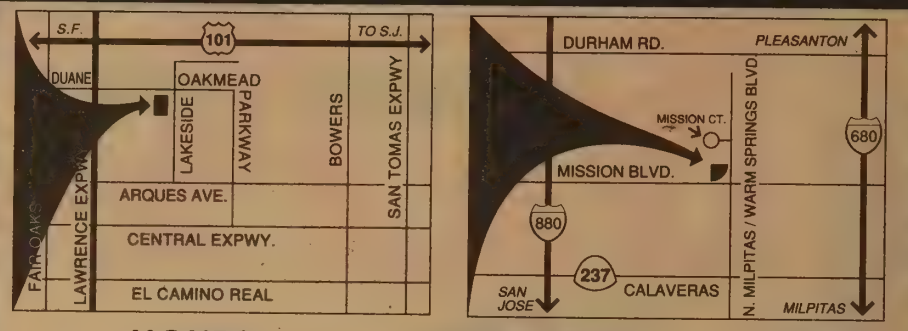

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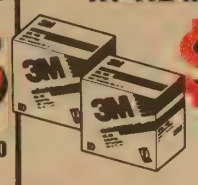

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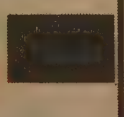

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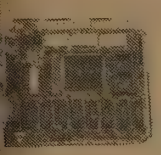

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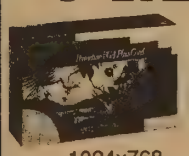

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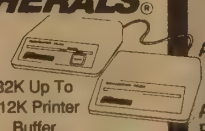

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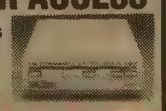

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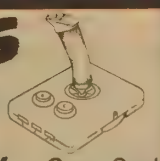

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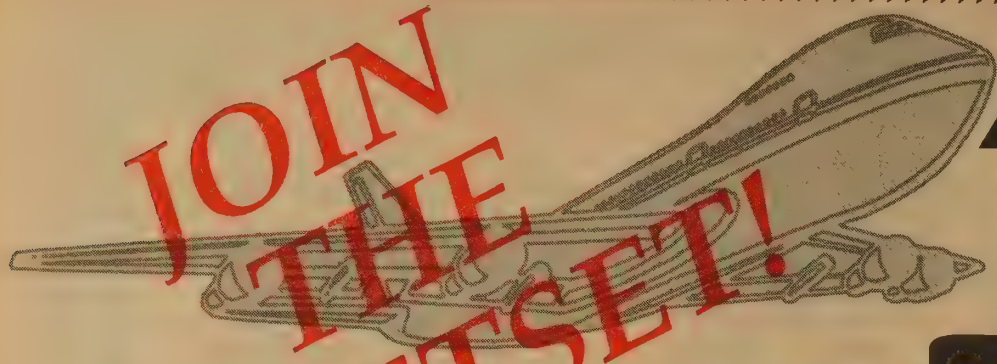

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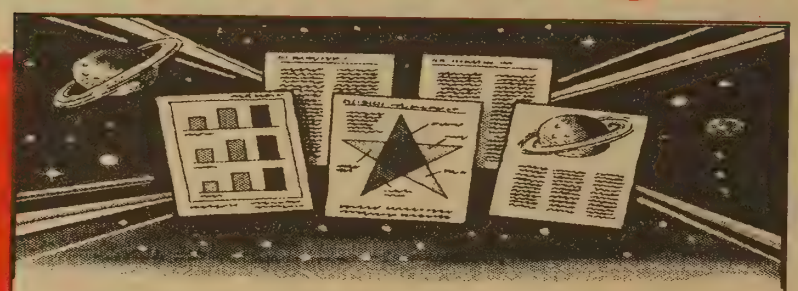

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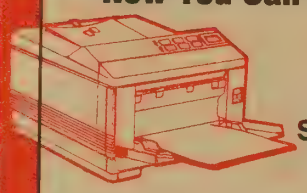

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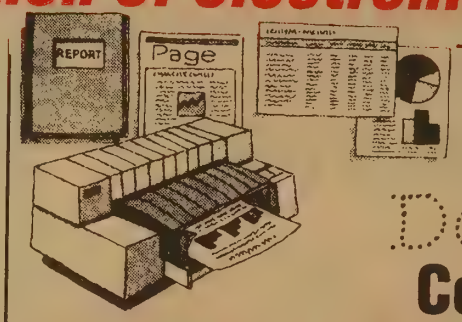

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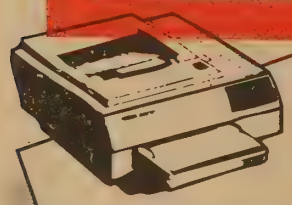

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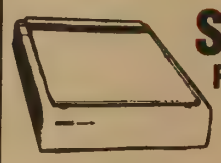

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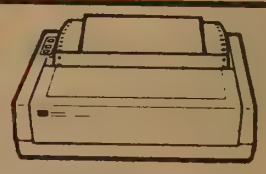

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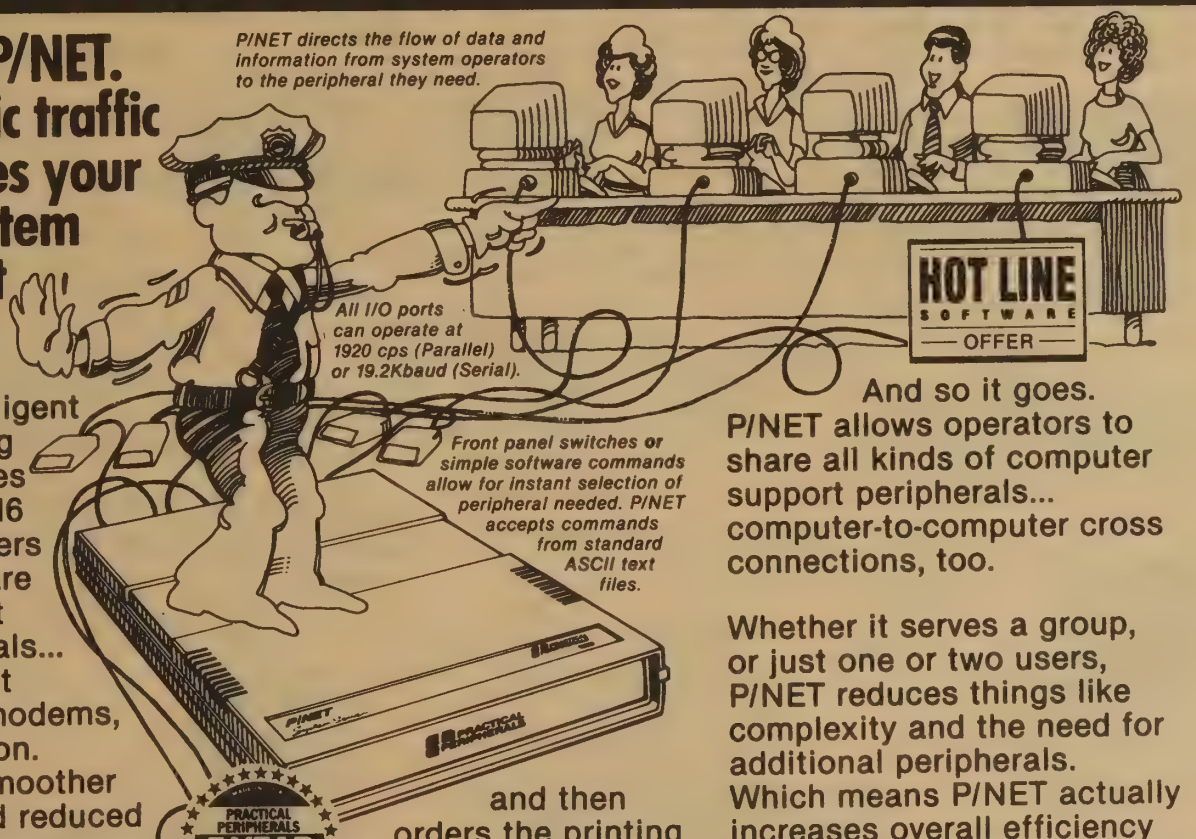

P/NET directs the flow of data and information from system operators to the peripheral they need.

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Link P/NET to a modem pool and operators never have to wait in line. If one modem is in use, P/NET automatically transfers the user to a modem not in use.

And so it goes. P/NET allows operators to share all kinds of computer support peripherals... computer-to-computer cross connections, too.

Whether it serves a group, or just one or two users, P/NET reduces things like complexity and the need for additional peripherals. Which means P/NET actually increases overall efficiency and productivity.

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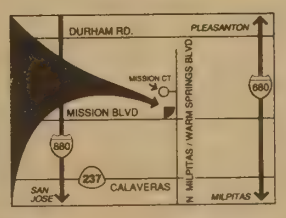

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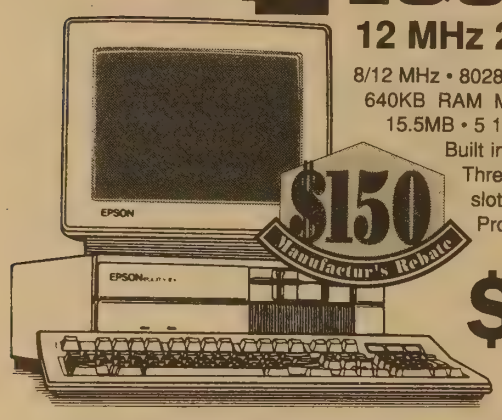

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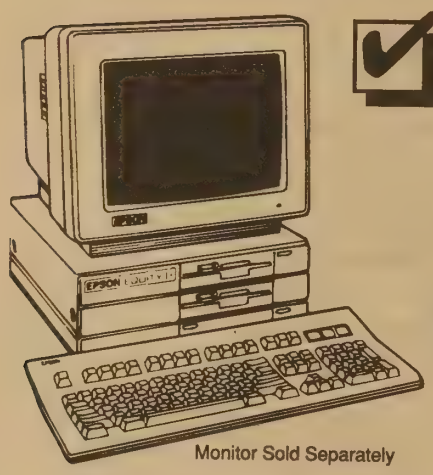

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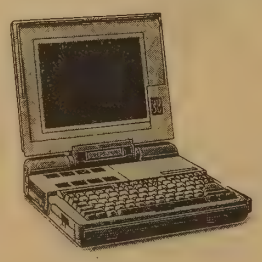

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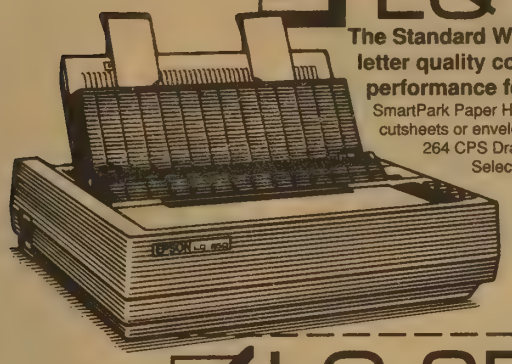

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264 CPS Draft • 88 CPS NLQ • Quiet 55 db Noise Level
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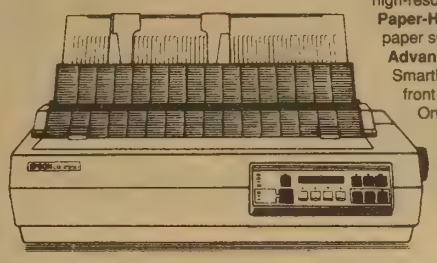

Superb Letter Quality • Highest quality 24pin technology for superior high-resolution text and graphics. Prints in Seven Colors
Paper-Handling Versatility • SmartPark let's you handle fanfold paper single sheets, envelopes and forms
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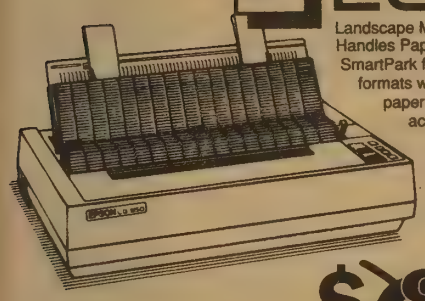
LQ-950



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Handles Paper Up To 11" Wide
SmartPark features let you switch paper formats without removing hardware or paper • eliminate paper waste and accurately adjust top-of-form position. • Superb Letter Quality Resolution • 360x360 dpi resolution Fast Performance
284 CPS Draft • 88 CPS in Letter Quality Mode

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Tractor Feed • 180 CPS Draft 60 CPS Letter Quality
360x360 DPI Graphics
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Opt. Multi-Font Cartridge

EPSON LQ-510
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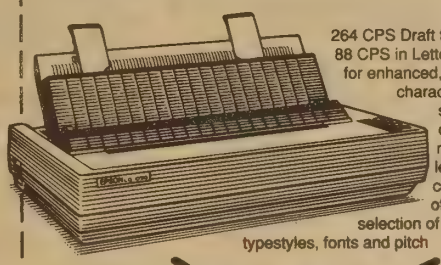
LQ- 1050



264 CPS Draft for High Speed • 88 CPS in Letter Quality mode for enhanced, high resolution characters Runs at surprisingly quiet 55 dB noise level • SelecType front control panel offers quick easy selection of popular typestyles, fonts and pitch

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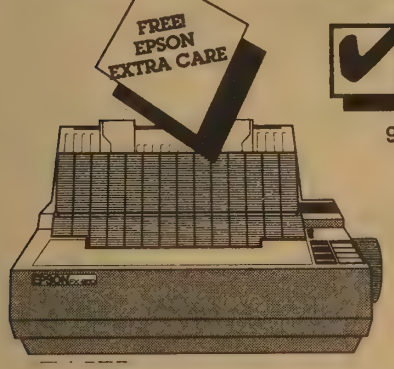
9pin Printers

FX-850



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54 CPS NLQ • SelecType
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Tractor Feed

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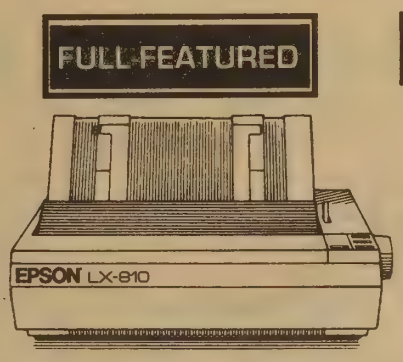

9 Pin • 80 Column • 30 CPS Draft
200 CPS NLQ • SmartPark Paper Handling • Opt. Multi-Font Cartridges
Built-In Tractor Feed

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FX-1050

9 Pin Printer •132 Column • 264 CPS Draft
54 CPS NLQ • SelecType • SmartPark Features
Push Feed Tractor • Opt. Cut Sheet Feeder
One Year Warranty

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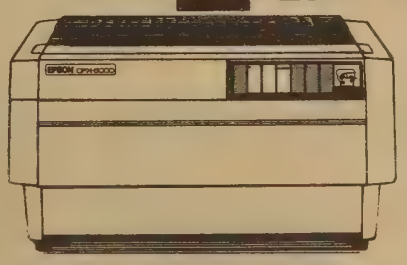
DFX-5000



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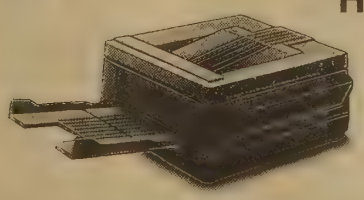

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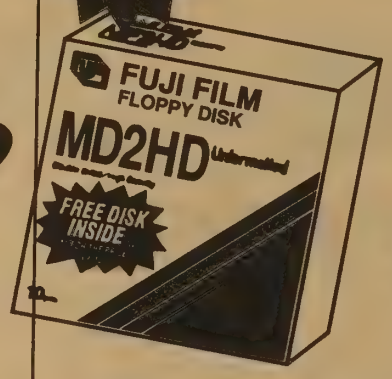

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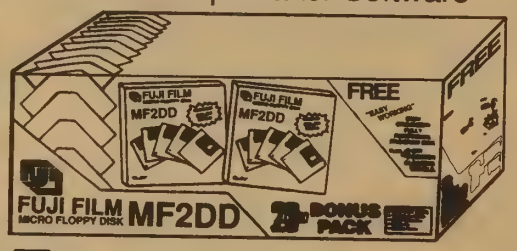

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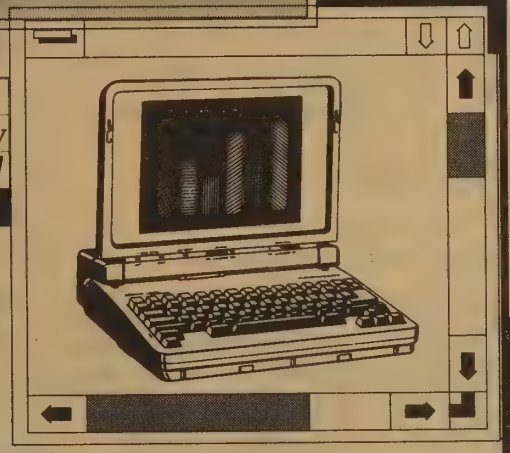

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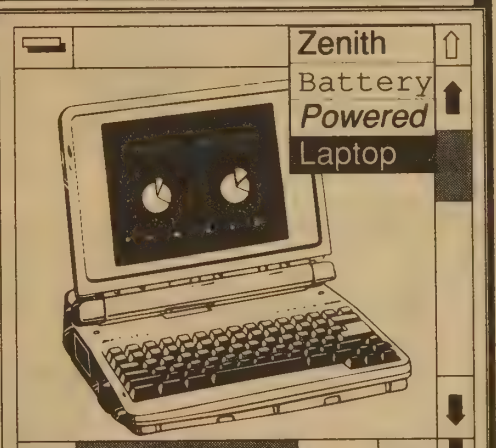

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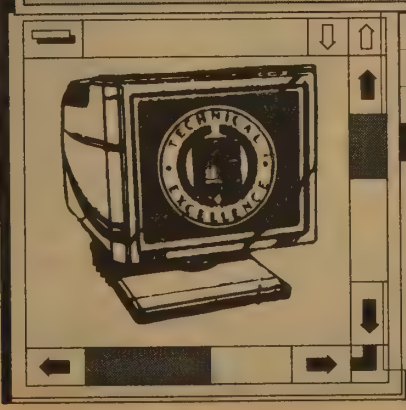

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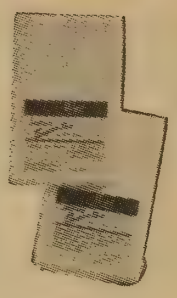

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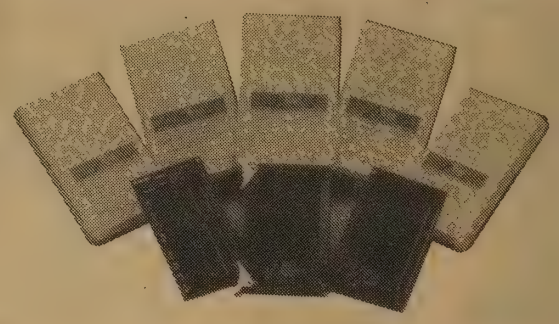

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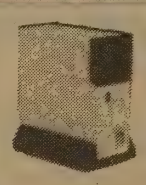

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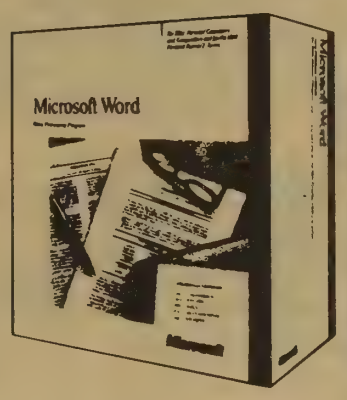

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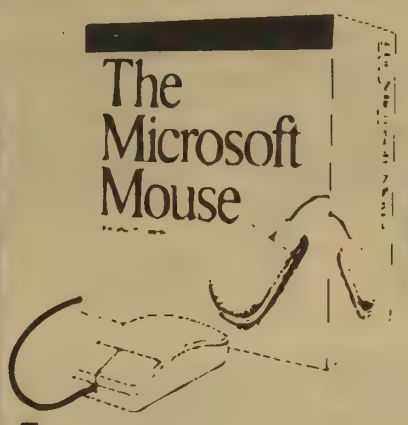

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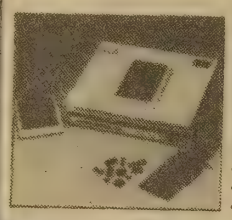

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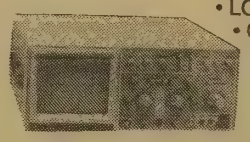

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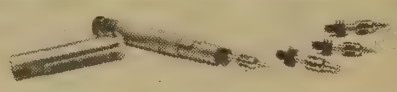

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cyberspace truly represents the next generation of human interaction with computers, it will represent the most profound change since the development of the personal computer." Right.

But that still doesn't tell us what it's good for besides extending human quirkiness to the storage of immaterial stuff. After all, most of what humans do with computers is merely an improvement over what they did with other keyboard-bound devices, whether typewriters or calculators. Word processing and numerical analysis will be no easier "inside" the machine than it was outside.

Let's quit being giddy for a moment. We're talking bucks here. Right now a good working platform costs almost as much as a CAT scanner. Who's going to buy one without something like Blue Cross footing the bill? And why?

There is a reason why Autodesk is involved in this enterprise besides some daydream of the Ultimate Hack. Whatever adventures they might entertain, they afford by selling AutoCAD, the dBASE III of architecture. How many architects have dreamed of the ability to take their clients on a walk inside their drawings *before* their miscommunications were sealed in mortar?

Virtual Reality has already been put to such use at the University of North Carolina, where Sitterman Hall, the new $10 million home of UNC's computer science department, was designed by virtual means.

Using a head-mounted display along with a handlebar-steerable treadmill, the building's future users "walked through" it, discovering, among other things, a discomforting misplacement of a major interior wall in the lobby. At the point of the discovery, moving the wall out was cheap. A retrofit following the first "real" walk-through would have cost more by several orders of magnitude. Thus, one can imagine retrofit savings from other such examples which could start to make DataSuits as common a form of architectural apparel as chinos and tweed.

Given the fact that AutoCAD is already generating nearly a billion dollars a year even without such pricy appurtenances as cyberspace design tools, it isn't hard to imagine a scenario in which developing workstations for virtual architecture comes to look like very shrewd business.

Then there is the burgeoning scientific market. Computers are the new microscopes. Increasingly, they allow us to see into worlds which are not only too small but too *weird* to bring to human scale before. For example, they are showing us the infinitely detailed order of chaos, never before observable, in a form which makes it possible to appreciate its simplicity as well as its complexity.

Virtual Reality promises the ability to not only see but to "touch" forbidden realms. Again at UNC, work is already quite advanced in which one can assemble complex molecules like Tinkertoys, the attraction or repulsion between individual atoms in the assembly modeled to the scale of human tactile perceptions. The pharmaceutical industry alone could have uses for such capacity sufficient to sustain a lot of CyberBiz.

One can imagine a lot of heretofore inaccessible "places" in which one's presence might be scientifically illuminating. A *Fantastic Voyage* through the circulatory system will become possible (with or without Raquel Welch). Or travel to alien worlds. (Thanks to Jet Propulsion Laboratories, I have already taken an extremely convincing helicopter ride down the Vallis Marinaris on Mars.)

Then there are all the places which have never before had physical existence on any scale: the rolling plains of mathematical topologies, the humming lattice of quantum states, cloud chambers in which mu mesons are the size of basketballs and decay over weeks rather than picoseconds.

The possibility for less sober uses seems equally fertile. One can imagine VR salons, video game parlors for big kids with Gold Cards, in which a central supercomputer provides the opportunity for a score of people to *be* Ms. Pacman. Or whatever. Nolan Bushnell, the founder of Atari and something of an expert on the subject of video games, is already at work on something like this.

The list of possibilities is literally bounded only by the imagination. Working bodies for the damaged. Teleconferencing with body language. Virtual surgery. Hey, this is a practical thing to do!

And yet I suspect that something else altogether, something not so practical, is at the root of these yearnings. Why do we *really* want to develop Virtual Reality? There seems to be a flavor of longing here which I associate with the desire to converse with aliens or dolphins or the never-born.

On some level, I think we can now see the potential for technology, long about the business of making the metaphorical literal, of reversing the process and reinfecting ordinary reality with luminous magic.

Or maybe this is just another expression of what may be the third oldest human urge, the desire to have visions. Maybe we want to get high. ■

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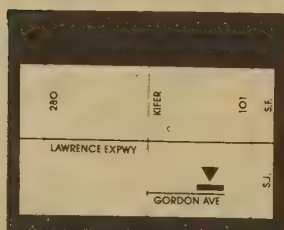

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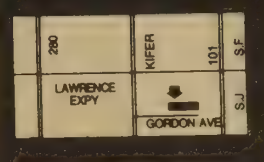

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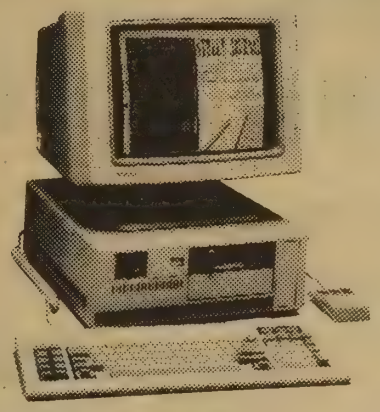

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- WA2 Controller
- 101 Keyboard
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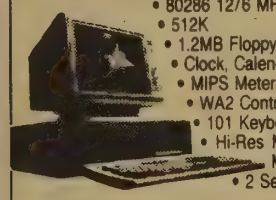

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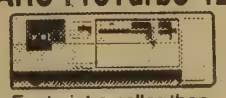

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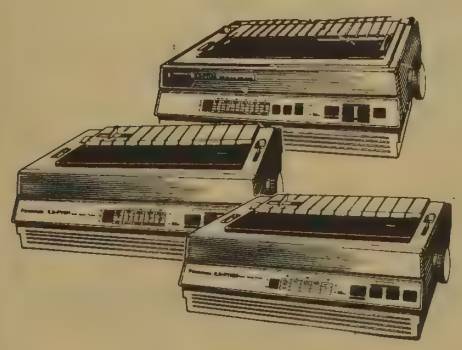

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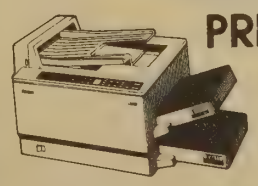

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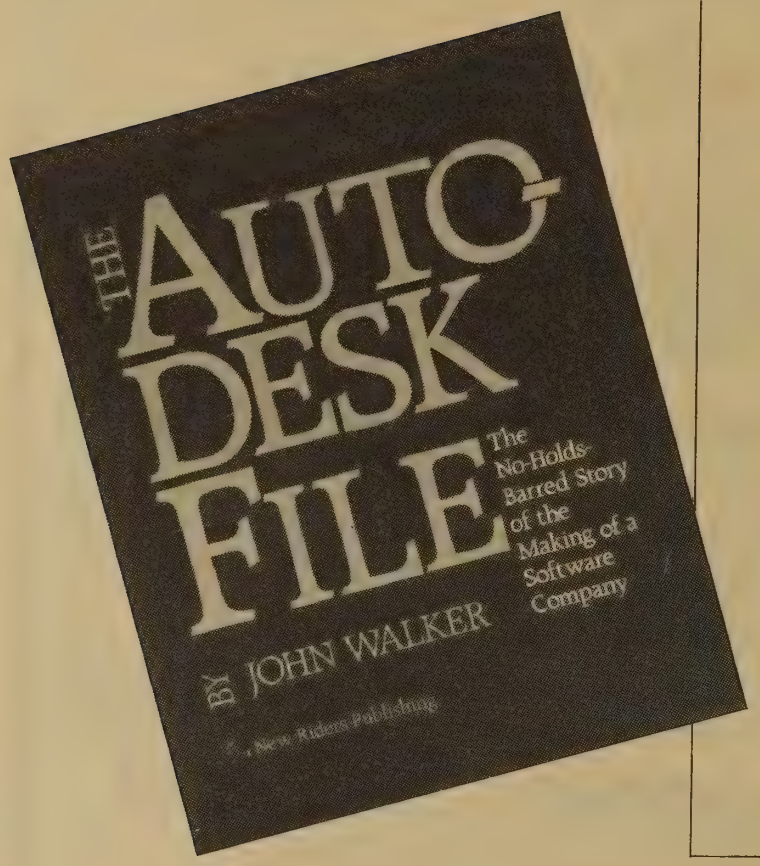
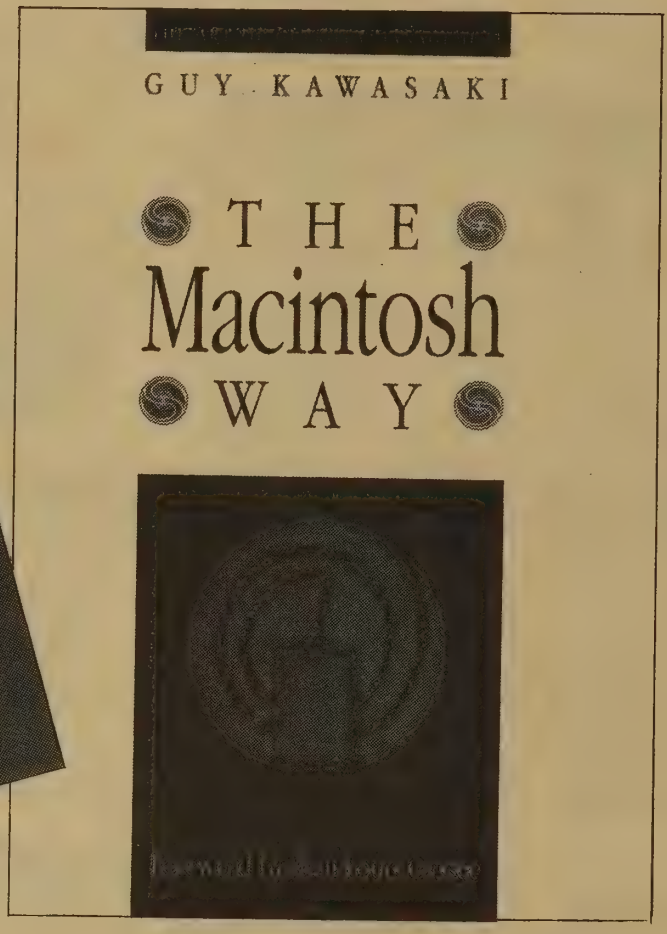
Books For The Entrepreneur

The Macintosh Way And The Autodesk File

By Mary Eisenhart





There's no shortage of books that chronicle and dissect the microcomputer business, offering endless analysis of what works and why. What's less common is the primary stuff—firsthand accounts of successful efforts by the people who made them. For this reason alone, Guy Kawasaki's *Macintosh Way* and John Walker's *Autodesk File* are of compelling interest to students of the industry and would-be entrepreneurs. They're also a lot of fun to read.

It would be hard to envision two people more different than Kawasaki and Walker. Steve Jobs may have founded the Macintosh Religion, but Kawasaki's the one who spread it around—he was the prime mover in Apple's software evangelism program, which he characteristically describes as "using fervor and zeal (but never money) to convince software developers to create products for a computer with no installed base, 128 K of RAM, no hard disk, no documentation, and no technical support, made by a flaky company that IBM was about to snuff out." He's irreverent, cocky, hilarious, and by his own (probably uncontested) admission gives the best demo in the industry. Things just haven't been the same at Apple, fervor-and-zeal-wise, since he left.

In contrast, Walker, the co-founder and first chairman/president of Autodesk (creators and publishers of AutoCAD), describes himself as "about as gregarious as a moray eel." His words are few and well-chosen, and he recently turned the helm of the company over to Alvar Green so he could return to programming and

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product development (see "Being In Nothingness," this issue).

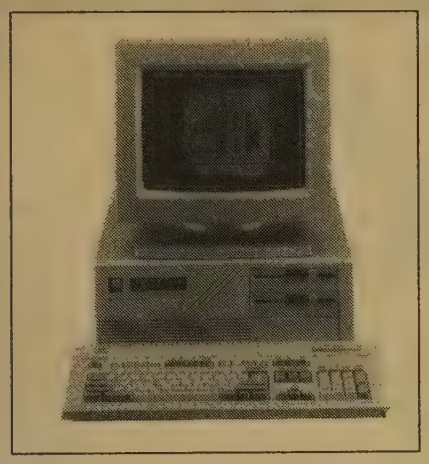
However, there's a common philosophy running through the books—as Walker put it:

Make the best product.

No bullshit.

Reward the people that do the work.

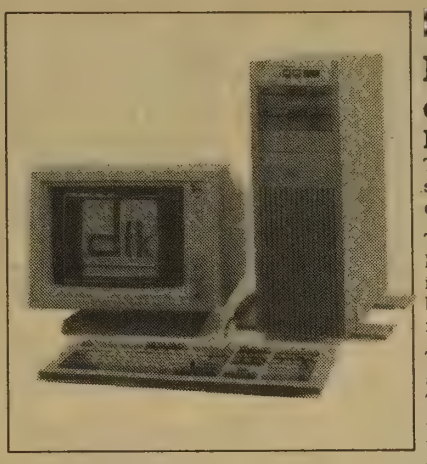
Kawasaki's book is nominally a



20 MHz System
Serves as Ideal CAD Workstation

DTK's FCC-Certified KEEN-2030 is a 20 MHz INTEL 80386-based high-performance system packaged in a mini-AT cabinet. It features 2 serial ports, 1 parallel port, 8 expansion slots and up to 8MB of RAM.

A 4MB version of the KEEN-2030, equipped with an 80MB hard disk and 80387 math coprocessor, was used by INFOWORLD magazine as the test bed for a product comparison of four high-end Computer-Aided Design (CAD) systems (See the July 17, 1989 issue).



25MHz Bare Bone System
Offers Low Price/High Performance with Cache

The DTK KEEN-2500 offers performance superior to other 80386-based 25 MHz computers, at a lower price.

The system utilizes the high-quality PEM-2500 motherboard with an innovative 64KB/256KB selectable write-back cache, eight expansion slots, and room for 16MB of 32-bit DRAM.

The KEEN-2500 is certified for hardware and software compatibility by XXCAL Test Labs. It is Landmark VO.99 rated at 43.5 and Norton SI V4.0 rated at 32.5, making it one of the fastest systems in its class. In fact, MIPS magazine rates it the 386/25 price/performance leader running under SCO XENIX.

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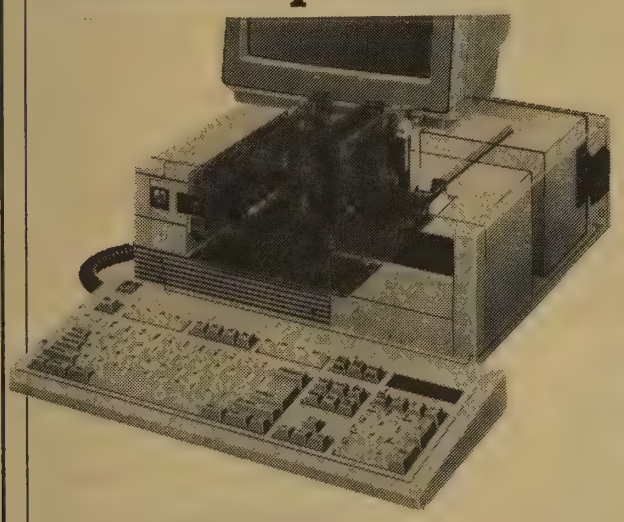

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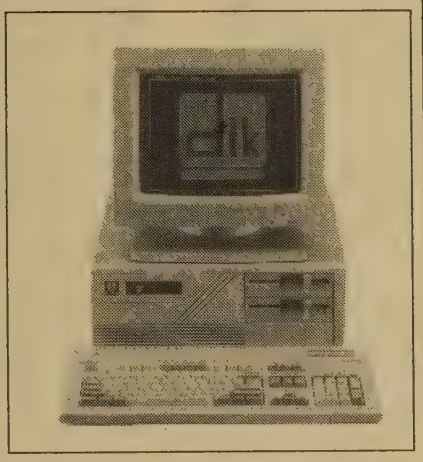
12 MHz Zero Wait State
80286-Based System Features VLSI Chip Set

Although the DTK TECH-1230C is packaged in a compact "Mini-AT" cabinet, the system delivers "BIG" system performance. Incorporating the DTK Mini-AT motherboard with built-in serial and parallel ports, the TECH-1230C features the VLSI chip set and eight expansion slots (four 16-bit and four 8-bit).

The TECH-1230D uses the same motherboard, but comes in a full-size AT cabinet where extra drive bays are a concern. Both systems are FCC, UL and SA certified and come with DTK's one-year warranty.



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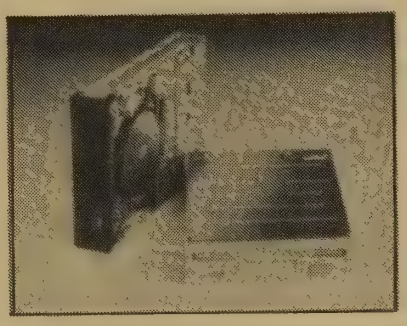

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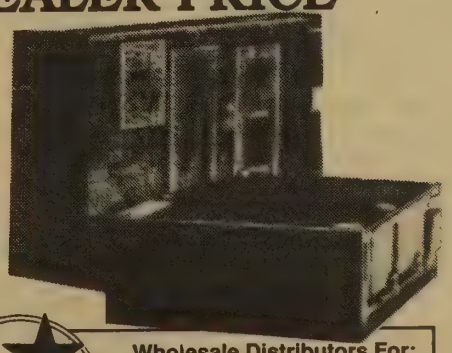

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- 1:1 interleave provides highest ST506/412 performance
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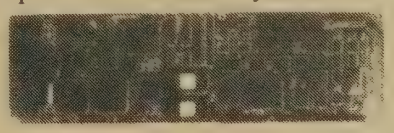
- Employs low-power CMOS design
- Circuit board is half-length, XT height



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OMTI 8250	2		•		2	full card
OMTI 8257	2			•	2	full card
OMTI 8620	2 or	2	•		2	full card
OMTI 8640		2			2	full card
OMTI 810	SCSI host adapter					full card
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The Autodesk File (subtitled "The No-Holds-Barred Story of the Making of a Software Company") is not flashy, and is a book only after the fact, consisting of internal Autodesk papers from before the company's foundation to Walker's gleeful resignation of the chairmanship.

treatise on applying the strategy that made the Mac successful to the efforts of would-be Mac developers and other entrepreneurs. The reader's path is strewn with real-life illustrations and anecdotes from Kawasaki's industry adventures; many of them, told with great relish, highly discomfiting to Ashton-Tate, chief rival of Acius, where Kawasaki was president while writing the book. Caustic comparisons are made between the respective levels of customer support meted out by Nordstrom and Apple. *The Macintosh Way* also includes "exercises"—e.g., "Go to a speech by a company president. Does he have a PR flack babysitting him? If he does, ask him why" and "Put your head in a vise. Squeeze it as tight as you can stand. This is what it's like to compete with Microsoft." There's even a chapter on preserving your relationship with your Significant Other while working morning, noon and night—a big part of the Macintosh Way. Kawasaki gives a book that's as good as his demo; *The Macintosh Way* is flashy, entertaining, and thought-provoking.

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Though you might not think a collection of internal memos and reports would be compelling reading, the result is actually a highly effective epistolary novel of sorts: we see the founders struggling with the problems that plague startups—incorporation, funding, deciding what to develop (AutoCAD, the first program that allowed CAD functionality on a PC, was only one of a stable of offerings launched in hopes that one would take off. The others, including a little integrated package called Autodesk that gave the company its name, faded into oblivion early on). We see them driving all night through the desert to COMDEX and trying to figure out why the demo won't work, lamenting that bottlenecks in shipping threaten to put the company out of business, debating over whether to get outside financing (they didn't), emerging from a very successful public stock offering, and dealing with the changing problems of keeping a successful company on the cutting edge.

Perhaps because the memos in the book were written for Autodesk people by Autodesk people, we see all this unimpaired by hype and puffery. Witness Executive Vice President Dan Drake in the internal memo on Walker's return to the lab, much more entertaining than the official press release:

"'While he was president and chairman, John [Walker] invented the AutoSketch and AutoShade products and a number of other things, some of which aren't ready to be disclosed yet....Since that's what he likes to do best, and giving dumb speeches, reading reams of legalese, and talking to boring people on the telephone is what he likes least, this change increases the likelihood that Mr. Walker will continue to effectively contribute to Autodesk's success in the coming years.'

"Mr. Drake deprecated the suggestion that Mr. Walker would 'do a Mitch Kapor': sell all his stock and start a new company. 'Whatever you say about John, he's quite bright enough to learn from experience. Besides, I'd kill him,' said Mr. Drake in a paragraph he wishes he could include in the release."

So if you've had about all the theory and analysis you can take, read these books. They'll give you a fascinating inside view of some of the industry's most noteworthy successes, and also give you a useful repertoire of stories to tell at all those industry parties. (*The Macintosh Way,* ISBN 0-673-46175-0, Scott, Foresman and Company, 1990, $19.95; *The Autodesk File,* ISBN 0-934035-63-6, New Riders Publishing, 1989, $24.95.) ■

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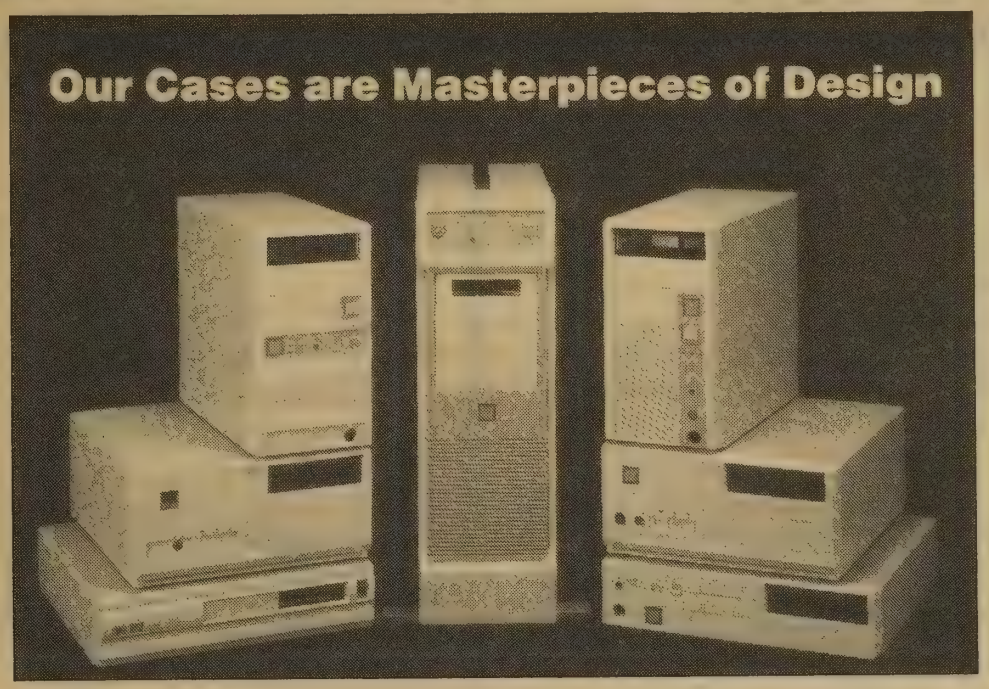
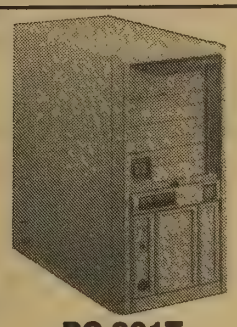


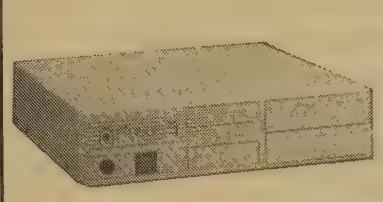


PC-901T

- Medium tower case for Baby AT, Big AT or XT compatible
- For three 5¼″ FDD, two 3½″ FDD & one 3½″ HDD
- 4 LED indicators and Turbo switch
- Patent Reset switch to prevent data loss
- With MHz display range to 99 MHz
- 1.44 mm metal sheet
- Dimensions: 7⅞″x16″x15¾″
- 1 pc/carton/4.5 cu ft
- N.W.: 10 kgs, G.W.: 12 kgs

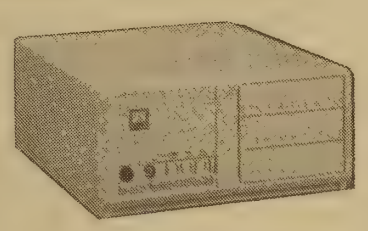
PC-601T

- Mini-tower case for Baby AT or XT compatible
- For two 3½″ FDD, two 5¼″ FDD & one 3½″ HDD
- 3 LED indicators, Turbo & Reset switch, keylock
- Patent Reset switch to prevent data loss
- 1.2 mm metal sheet
- Dimensions: 7″x16″x13¼″
- 1 pc/carton/1.56 cu ft
- N.W.: 7 kgs, G.W.: 8 kgs



PC-303

- Slim case for Baby AT, XT or PS/2 compatible
- For two 3½″ FDD (or 3½″ FDD & HDD for each) & two 5¼″ FDD
- 3 LED indicators and Turbo switch
- Patent Reset switch to prevent data loss
- 1.44 mm metal sheet
- Dimensions: 16⅜″x15⅝″x4″
- N.W.: 6 kgs, G.W.: 7 kgs



PC-103

- Slide-in case for Baby AT, Big AT or XT compatible
- For three 5¼″ FDD & one 3½″ FDD
- 3 LED indicators, Turbo & Reset switch, keylock
- 1.2 mm metal sheet
- Dimensions: 14¼″x16¼″x6⅝″
- 1 pc/carton/1.50 cu ft
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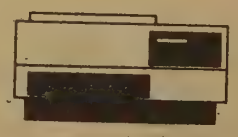

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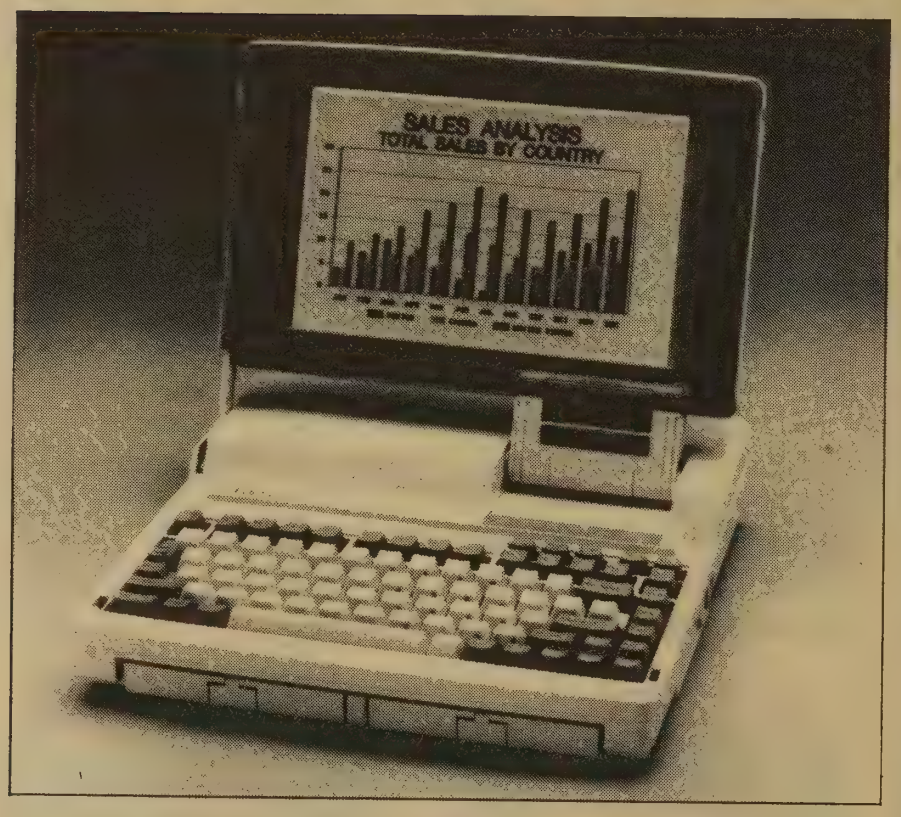
The Toshiba 1600— A Powerful Portable With Lots Of Options

By Ed Kahn



We have come to expect exceptionally well-designed portables from Toshiba, and the model T1600 is no exception. It is a fast and versatile machine, powered by an 80C286 central processor running at 12 MHz. Despite its speed and power, it weighs only 11.7 pounds with a hard disk and a high density 1.44 Mb 3 1/2" floppy drive.

Despite the advertising hype, most portables are merely modules of a larger computer system. You use a desktop machine, but pick up a portable when you will be away. The T1600, however, really can serve as both a desktop and a portable. Unlike any other portable I've seen, this machine lets you completely remove the LCD display when you want to use the computer as a desktop unit.

But configuring a complete system is not cheap. A basic system with a 20 Mb hard drive is nearly $5,000, $200 more with a 40 Mb drive. The unit comes with a full megabyte of RAM. You have the option of increasing this memory in two-megabyte units ($1,099) up to a total of five megabytes. This additional memory can be set up to work as extended memory, expanded memory that conforms to the Lotus-Intel-Microsoft EMS specifications, a RAM disk, or a hard RAM drive—which is much like a RAM disk except that it retains its memory even when the computer is turned off, as long as either an AC power supply or a battery is in place.

Battery Operation

Toshiba has gone out of its way to make sure that battery operation is smooth. The flexible battery system extends the length of battery operation and provides for backup of data if the battery pack runs down.

The T1600 has room for two removable NiCad batteries. This doubles the time you can use the computer on batteries. The unit comes with only one removable battery, but additional battery packs ($69) are available. The computer also has an internal backup battery that's automatically recharged by either the AC power supply or a battery pack. This maintains power during battery pack swaps.

The T1600 also lets you use software to check just how much life is left in each of the removable battery packs. By pressing a couple of keys, you will see a window that indicates battery reserves.

You can set a number of options to extend battery life. A CPU sleep option disengages the CPU after a certain period of non-use. The CPU comes back to life as soon as a keyboard entry is made. Similar functions disable the hard drive, LCD backlighting and optional built-in modem. Toshiba offers a reflective LCD EGA display ($689); it uses a good deal less battery power than the backlit model that comes as standard equipment. Removing or changing the LCD is literally a snap.

Toshiba has designed this com-

Most portables are merely modules of a larger computer system. You use a desktop machine, but pick up a portable when you will be away. The T1600, however, really can serve as both a desktop and a portable.

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puter with an AutoResume feature, which permits you to configure the T1600 so that when you turn off the machine, it will save everything and return you to the same place when you power up the next time. This makes things extremely easy for DOS dreaders.

EGA Display

The backlit LCD that comes with the unit gives a crisp, clear display with EGA resolution. These days, most LCD displays are adequate. But EGA is really important when you connect the computer to a good color monitor. I tried it with a Mitsubishi Diamond Scan, and the results were great. I like being able to easily remove the entire LCD. This leaves just the computer with its keyboard. Somehow getting the LCD screen completely out of the way makes the T1600 feel like a standard computer equipped with an EGA adapter card.

Keyboard: Small But Comfortable

The keyboard still lets you know that you are working on a portable. Even though it is by no means a conventional layout in terms of what you'll find on most desktop units, it has an excellent feel and a well-designed layout. It is reasonably standard except that there is no separate numeric/cursor control keypad.

Toshiba has set the keyboard up with an "Fn" key and an embedded numeric key/cursor control pad. Although I generally hate such arrangements, I had no problem with this machine because of the skill with which Toshiba designed the keyboard. Usually embedded keypads make many ordinary functions inconvenient. But Toshiba has sidestepped most of the problems by including a column of keys along the right side of the keyboard that gives you Home, PgUp, PgDn, and End keys in addition to the cursor arrow keys. Furthermore, they have provided standalone + and - keys so you do not have to use fifteen fingers to do the simplest numeric operations.

This is the best compromise I have seen on a lightweight portable. Although this is a small keyboard, both keys and layout are full size. Only the overall width of the keyboard is less than the 20 inches we have come to expect with freestanding desktop keyboards. I used this machine a lot and never felt severely hampered by the keyboard.

So many units require you to make sacrifices in order to get a lightweight unit; this machine, however, has really achieved a wonderful balance. It is powerful, portable, and lightweight.

For users who need a separate numeric keypad, a 17-key optional keypad ($99) is available. I would have preferred it if Toshiba had designed this machine to accept a whole keyboard of your choice, instead of only Toshiba's own numeric keypad.

Options

The Toshiba T1600 comes with a number of options, including two different modem arrangements. Two models of 2400 baud modems ($349 and $399) allow you to choose either

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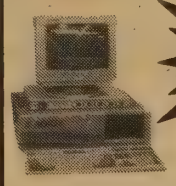

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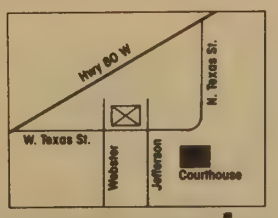

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of two different installation slots in order to best accommodate your other expansion needs.

Both modems are Hayes compatible. Both are internal, although one fits into one of the proprietary expansion slots while the other is installed in a location that can hold either a modem or the interface card ($199) that allows the use of an expansion chassis ($999) that can hold up to five standard expansion cards.

The machine I tested came with the "internal" modem that fits on the side of the machine. It worked flawlessly, but one feature caused me a little confusion. There are two settings on the modem: on and auto. The auto setting, an energy-saving device, picks up a signal from most software and then turns on the modem. The on setting simply leaves the modem on, and some software will work only with this setting. But in any case, you must start the computer in the auto position and then switch to the on setting if necessary. I use a piece of software that required me to manually turn the switch to on. This meant that when I turned off the computer, I had to remember to set the switch back to auto, or the next time I powered up, the modem would not work. After I adjusted to this slight inconvenience, the modem did everything it was supposed to do.

Enough options are available to enable the user to achieve almost any desired configuration. From lots of memory, to any expansion cards you want—this system can accommodate it all. Toshiba sells more options than we can list. For users who need to use 5 1/4" disks, an external 360 K drive is available ($499). A fabric carrying case ($89) has room for cables and accessories as well as the computer itself. Although the system comes with MS-DOS 3.3, OS/2 ($325) is available.

Documentation

And finally, the documentation is excellent. Many computers come with skimpy documentation, while others come with so much technical data that few users can wade through it all. Toshiba has reached a wonderful balance. On the one hand, the documentation fills a hefty slip case with four volumes of information. But Toshiba also includes thin manuals written simply enough for anyone to be able to use. The clearly written documents are filled with illustrations to avoid confusion.

Not only does Toshiba provide excellent written documentation, they also include a disk containing both the DOS and T1600 reference manuals. The information is tied together with hypertext. Hypertext provides a new dimension in ease of access.

The manuals are organized with both a table of contents and an index. When you find a topic you want, you simply press the enter key and the information appears on the screen. If you then toggle the cross reference option, a number of words in the text will appear in a different color or shade. If you move the cursor to any of these words and press return, you will jump to a discussion of that topic. Thus, you are able to move quickly from topic to topic in whatever way suits your needs.

I believe Toshiba is the first manufacturer to include this kind of on-disk documentation. They have set it up so that it can be installed as a memory resident program, which is extremely useful when you are first finding your way around.

Conclusions

It is hard to imagine anyone who wouldn't enjoy working on this computer. So many units require you to make sacrifices in order to get a lightweight unit; this machine, however, has really achieved a wonderful balance. It is powerful, portable, and lightweight. ■

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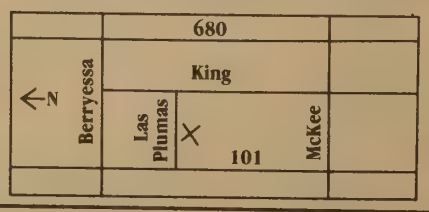

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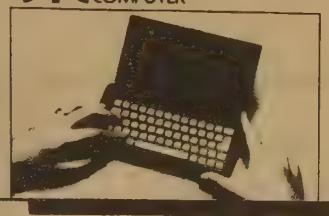

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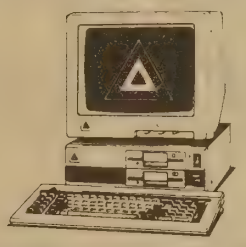

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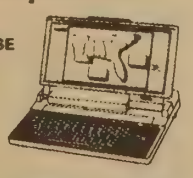

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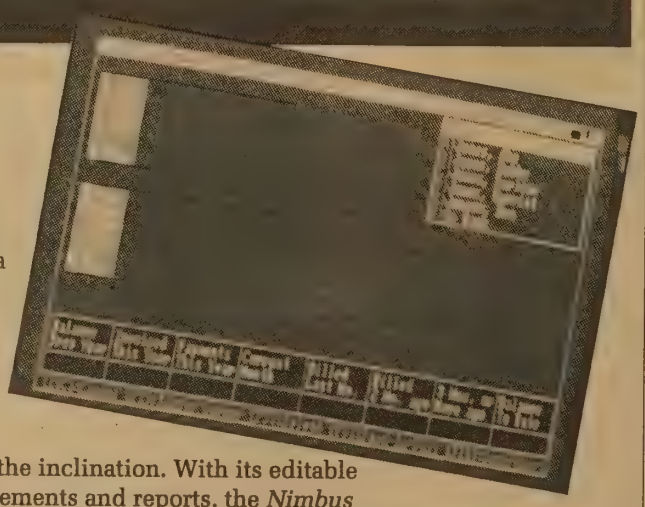

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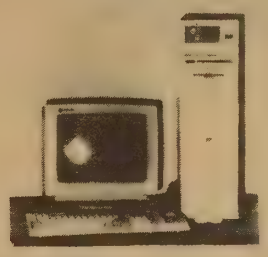

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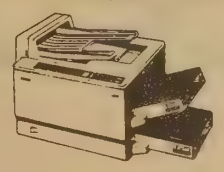

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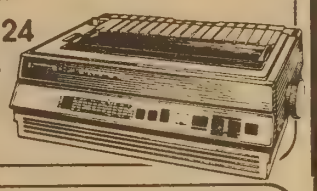

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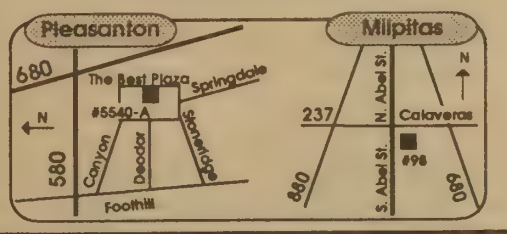

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MAC @ WORK

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SmartForm Designer

A Great Tool For The Mac Office, But Will Corporations Go For It?

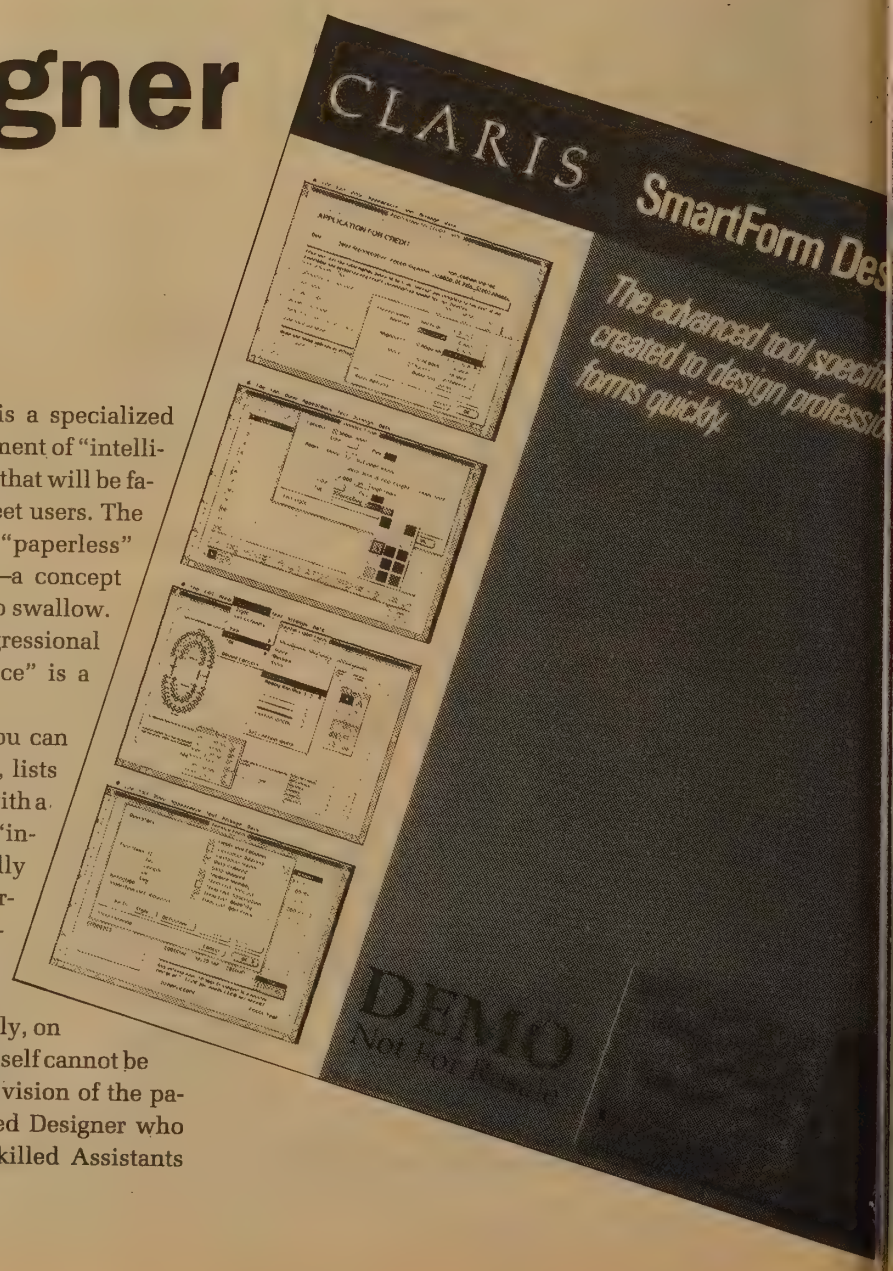
By Mike Markowitz

From birth certificate to burial permit, we live and die by paperwork. A large corporation may have over ten thousand different forms, none of them with enough space to write in. Form design is a recognized profession, with its own national association. A good form designer combines the trained eye of a typographer with the instincts of a systems analyst.

The development of the laser printer was both a blessing and a curse for corporate form design. The blessing was that high-quality printed forms could be produced quickly and easily. The curse was that everyone wanted to get into the act. A Macintosh with a LaserWriter allows an unskilled user to turn out convincing, official-looking blank forms, with neat, straight lines. With a scanner, or a bit of skill, you can add the corporate logo. From the designer's viewpoint, this is an open invitation to ugly, inefficient designs. From a management viewpoint, it could be a recipe for chaos.

SmartForms from Claris is a serious attempt to apply the blessings of Macintosh technology to form design, while avoiding some of the curses. You could certainly design a business form using general-purpose software, like MacDraw II or PageMaker. SmartForms, however, is a specialized tool for the creation and management of "intelligent" forms. It has many features that will be familiar to database and spreadsheet users. The product is optimized for the "paperless" Macintosh office of the future—a concept that few corporations are ready to swallow. (Like "jumbo shrimp" or "congressional ethics" the term "paperless office" is a classic oxymoron.)

Using SmartForm Designer, you can create and precisely place fields, lists and other typographic elements with a few mouse clicks. You can add "intelligent" fields that automatically perform calculations, check for errors, and format data entries. Using SmartForm Assistant, a separate application, someone else can fill out your form electronically, on another Macintosh, but the form itself cannot be altered or modified. The beatific vision of the paperless office includes one skilled Designer who creates forms, and many semi-skilled Assistants who fill them out.



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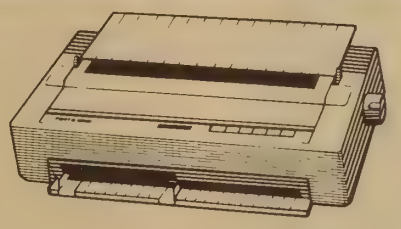

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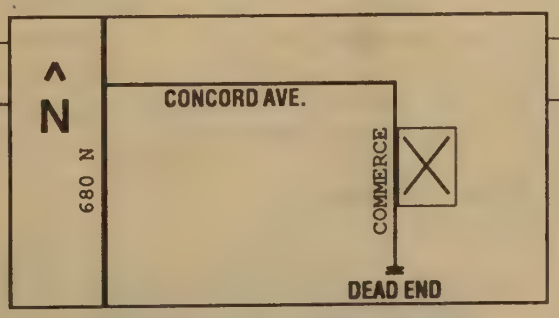

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The Package

You get four disks: SmartForm Designer (696 K), one copy of SmartForm Assistant (541 K), and a separate HyperCard tutorial for each application. There is a concise "Getting Started" manual, a massive, well-indexed and well-illustrated User's Guide for SmartForm Designer, and a slim booklet for SmartForm Assistant, plus a Quick Reference Card on eight pages of heavy card stock. Another thoughtfully designed little booklet includes information on user support, and a set of business reply cards for product registration, change of address and replacement disk orders. Additional copies of SmartForm Assistant can be ordered at low cost, and multi-use licenses are available for large installations.

Version 1.1 (mailed free to registered owners) added support for Encapsulated PostScript files and defined aditional date formats. The concept of "Form sets" was also added to SmartForm Assistant. Form sets can be exported in SYLK, DIF, DBF and WKS formats, searched and grouped in various ways.

Design Tools

SmartForm Designer uses a floating tool palette similar to the one in HyperCard. There is an arrow cursor for selecting objects, and standard drawing tools for lines, boxes, ovals and text objects. There are also four unique field tools (the cursor changes to show which one is currently in use) which create fields on your form by simply dragging the mouse over the desired location. A **field** consists of a label and a data entry area. A **special** field contains data automatically filled in by the program (date, time, page number, etc.) A **list** consists of rows and columns, and a **repeating group** is a set of basic elements that are used over and over, usually on the same page.

A Macintosh with a LaserWriter allows an unskilled user to turn out convincing, official-looking blank forms, with neat, straight lines. From the designer's viewpoint, this is an open invitation to ugly, inefficient designs. From a management viewpoint, it could be a recipe for chaos.

If you use fairly standard forms and don't want to design them all from scratch, you have more options. Antic Software, a famous name in the Atari world, has joined in the success of SmartForms by offering two volumes of "FLEXFORM Business Templates," dozens of commonly used accounting and administrative forms that can be modified with SmartForm Designer and filled out using SmartForm Assistant.

An Ideological Problem

Smart Forms is a skillfully designed and executed package, with Claris's usual high standard of support. The basic premise, however, is flawed. In most corporations, printed forms are instruments of executive-secretarial power. She who controls the paper can impose Her will. In many cases, forms are created to obstruct, delay and prevent actions, not to facilitate them. Any product that simplifies the process of creating and managing red tape is a deadly threat to the established order, and will be viewed by The Bosses as profoundly subversive.

In those few lucky creative, humanistic offices where the Macintosh Way is part of the furniture, a product like SmartForms may find a niche, but not in the vast majority of American white-collar slave pits, where the mind-numbed generate mountains of meaningless documents for the brain-dead. ■

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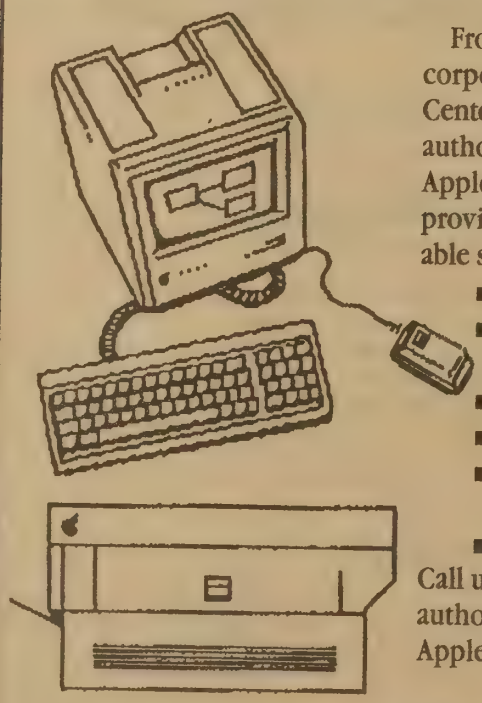

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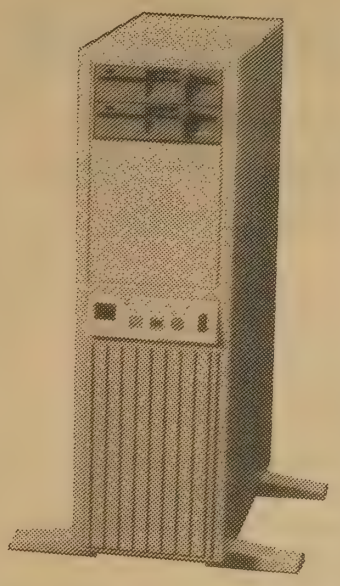

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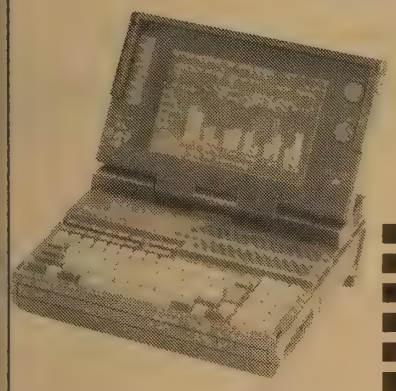

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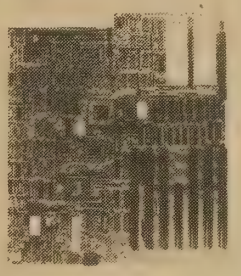

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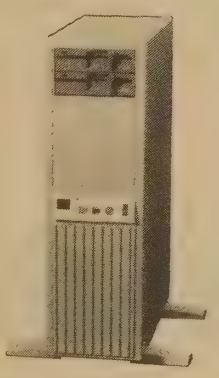

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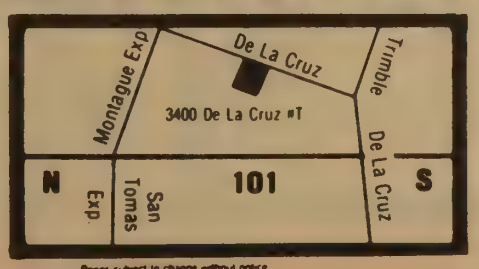

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MAC @ WORK

BMUG

BY DAVID MORGENSTERN

Sinister Soviet Software, Excess At COMDEX, Word Hacks, And More

We've got a storm full of news and tips pouring on the page and that's a miracle. This column was supposed to contain BMUG predictions of the upcoming year and some awards. Unfortunately, I got bitten bad by the *TETRIS* bug, and the hours normally spent roaming the netwaves in search of goodies were spent improving my Level 7 and 8 score. I won't make any promises about next month either, since I have the Desk Accessory version installed and "reward" myself for every other sentence I write. Holy MacPavlov!

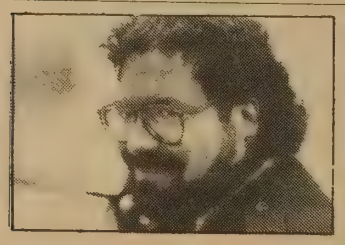
King Tetris

TETRIS is the incredibly popular game invented by Alexey Pazhitnov and Vadim Gerasimov of the Soviet Union. It's available for almost all brands of computers. It's now out for Nintendo game machines and even tiny hand-held back-pocket jobs. The Macintosh versions are packaged by Spectrum Holobyte.

There's no doubt that this was the last pre-Glasnost attempt by the USSR to destroy the economic viability of the West. Computers are one of our few edges against the sharp Russkie eggheads honed on chess and vodka. I can see the meeting, right out of a James Bond film. "Da, comrade programmer, the Westerners will spend all their computer time, at work and home, moving stupid shapes around a column. Their spreadsheets will shrink and their databases acidify!" Doctors report an increase in one-handed Carpal-TETRIS Syndrome running through the ranks of our nation's finest users.

After playing the game awhile, I wondered what the lowest possible score could be. This is perhaps a comment on my terrible play, or just further evidence of the decay of a once-stable mind. I spent a couple of hours "low-balling" the game and found that just letting the figures drop gives a score around 250. My best–worst score was 135 points, and that took some quick-fingered play. A Spectrum Holobyte representative claimed that no one had ever brought this to their attention.

Users attending the November BMUG West meeting, held monthly at San Francisco's Exploratorium science museum, got a glimpse of the latest *TETRIS* spin-off, *Welltris*. In this version the shapes slide down the sides of a three-dimensional shaft, or "well." Shapes can be split as they wrap around the corners of the grid and dropped into place—it is brutal!



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Loathing And Loathing At COMDEX.

The annual COMDEX show in Lost Wages, Nevada is the computer world's love-fest. It's never been much of a Macintosh parade.

Last year the Mac exhibitors were put in a ghetto called MacDEX and no one came through the door. This year Apple decided to be brave and sat on the floor with a mainly blue-blooded crowd. The NeXT dandies didn't make the scene—according to their marketing director, "It's a waste of time."

The parties thrown during this show are some of the best and most extravagant in the computer world. On the third day of the show the main exhibition hall was almost a ghost town—everyone was totally hung over from the major parties of the previous night. Special mentions went to John Dvorak's party at the wild Liberace mansion and the Software Ventures' spread, with visits by our local celebrities John Draper (Captain Crunch) and St. Silicon. This high living left most of the world's computer press with high fevers brought on by the latest version of the flu.

Here are a few rewarmed hors d'oeuvres from COMDEX:

- Steve Beck of Lapis Technologies, Inc. staged a marriage ceremony at a real Las Vegas chapel between the PC and the Mac. The product being promoted was the DisplayServer SE, a board that lets a Mac SE use lower cost PC monitors. A local TV station even did a three-minute review of the event on the 11 o'clock news. Steve was dressed as a clergyman and used the *Macintosh Bible* in conducting the ceremony. The print ad that appeared after the show has the Mac as the bride and calls the product "the greatest union since Prince Charles and Lady Di!" Does this make John Akers and Steve Jobs fathers-in-law?
- Spinnaker Software showed the latest versions

The big draw at COMDEX was a conversion utility that let HyperCard stacks run under the Plus on the PC. IBM is very hot on multimedia and is looking into bundling Plus with an upcoming machine. Apple gave everyone the no-comment routine, but smoke was definitely seen coming out of executives' ears.

Mac '90

BMUG's annual Macintosh show and love-fest in October is oddly enough called the MactoberFest—except when it's delayed by earthquakes! Come one and all to *Mac '90*, the best way to start off a Mac-decade.

The show will run two days, January 30–31, in the Pauley Ballroom in the University of California Student Union. Both days will feature vendor booths, lecture discussions, and raffles. We're working up someone special for the Tuesday night speaker—last year featured St. Steve and the first public showing of the NeXT computer.

The first day will be our annual BMUG show-off day, where members demonstrate their software expertise. Nowhere else under one roof can you see so many different programs, including some rare scientific applications, and talk to real users.

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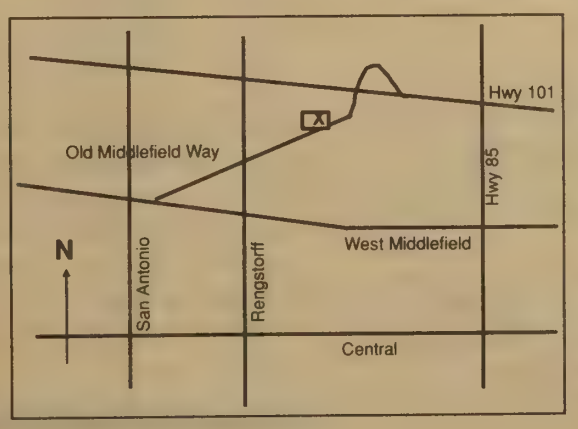

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of its hypermedia program, *Plus*, that runs on the PC and the Mac. They claimed they would ship versions for the Mac, MS *Windows*, and OS/2 Presentation Manager early in the new year.

The demonstration that drew people to the booth was a conversion utility that let *HyperCard* stacks run under the PC *Plus* versions. IBM is very hot on multimedia and is looking into bundling *Plus* with an upcoming machine. Apple gave everyone the no-comment routine, but smoke was definitely seen coming out of executives' ears.

• Almost anything and everything showed up in booths. When Peter Norton of the *Norton Utilities* couldn't make it in the flesh, his booth made do with a life-size cardboard cutout. Booth bimbos and Elvis impersonators were on hand to help folks make their important PC decisions. Viva Las Vegas...

• A combination mouse and graphics tablet called the Wiz was introduced by CalComp for PCs and Macintoshes. The device consists of a three-button mouse and a special template holding pad. For an additional $50 you can buy templates for popular programs, so you can click on the pad instead of working your way though menus on the screen. Do Wiz-mice like CheeseWhiz?

Type A Personality

The *Adobe Type Manager (ATM)* software hit the streets and went gold in a week. Everyone was clamoring for this Control Panel Document (CDEV) that reads Adobe PostScript font outline information and draws the fonts to your screen. Adobe claimed that ImageWriter II users would never again suffer from the "jaggies"—type with jagged edges. The packaging for the software shows a miserable letter "M" that could serve as an escalator at the local mall, transformed into a magnificent rocket-smooth model.

It didn't take long for the pig iron to show through the gold plate. Not everyone was happy with *ATM's* vision of a type-ical Mac user. The problems seemed to come from users' hyped-up expectations of the software, the cost/benefit of *ATM*, and some bugs with popular type-using programs.

ATM promised that it would dramatically improve the appearance of ImageWriter printed text. That's not always true. The Macintosh relies on specifically sized bitmap fonts installed in the system to produce characters. If a certain size is not in place, the Mac's *QuickDraw* software tries its best to build one. The result is almost always a mess. Since *ATM* uses a mathematical formula (the outline) to create the font, all sizes are always available. Large characters printed on an ImageWriter under *ATM* look great when a specific size isn't installed, but the small commonly used sizes are not improved significantly. ATM will actually use an installed bitmap at the smaller sizes!

Many of the purchasers of *ATM* wanted better printing, but didn't understand "the catch"—they'd have to come up with a lot of cash for their fonts. The software requires users to buy the fancy and expensive Adobe Type 1 fonts. The special downloadable font files must be placed in your System folder in order for ATM to function. This includes the fonts built into most LaserWriter printers. Users are having to fork over an extra $135 or more dollars to get those typefaces. Additional faces usually run around $75. This is in addition to the dough put up front to buy *ATM*. Ouch!

There was the impression given that *ATM* would also work with the many cheaper PostScript outline fonts from other publishers—not the case. They are in the bargain basement Adobe Type 3 format, not the first class Type 1 fonts. The non-Adobe faces will have to be converted to the better format when the specifications are released later this year.

Any new software release will have problems. There appear to be problems with fractional line widths styles, and kerning in some word processors—the very thing users bought *ATM* to fix! It can also degrade performance of already painfully slow programs on some flavors of Mac. If Adobe *Illustrator 88* is slower than a pill going down a dry throat on your Mac Plus before *ATM*, you'd better get a good book to read at redraw time.

So what should you do? Analyze your current needs carefully.

• If you use your ImageWriter primarily for correspondence, with few large fonts, think twice about *ATM*. BMUG has a number of shareware bitmap fonts optimized for the IW printer, like York, Palencia and Clairvaux. Give them a try!

• If you have a fancy dot-matrix printer, or a non-PostScript laser printer, *ATM* may be in your future. The program comes bundled with several common typefaces. Try them out thoroughly before investing in more fonts.

• If you use PostScript laser printers in service bureaus, you may or may not want to give ATM a spin. The cheapest way to have access to the Adobe fonts is to use the bitmap fonts for these typefaces with the current Mac operating system. They are available from BMUG on Fonts 21–36 disks.

The Volunteer Virus Brigade

Computer viruses have unfortunately become our permanent house guests, finding their way into the dusty corners of our software. BMUG is one of the Macintosh world's first lines of defense against the pests. Volunteers and staff working the HelpLine are always on the lookout for suspicious behavior, or new outbreaks. Users around the world send us software and files supposedly infected by undiscovered baddies. Most of the Petrie disks are devoid of infection, but they all have to be checked.

Greg Dow, our virus expert, bemoaned the many variables surrounding his research. He has to carefully examine and compare the suspect file's code,

Many of the purchasers of ATM wanted better printing, but didn't understand "the catch"—they'd have to come up with a lot of cash for their fonts. The software requires users to buy the fancy and expensive Adobe Type 1 fonts.

What Is BMUG?

BMUG is a nonprofit educational corporation, promoting the exchange of information. Like any growing organization, it is many different things to its 7500+ international members. BMUG, Inc. is a computer user group located in Berkeley, California. The group specializes in computers using a graphical interface. For a while that meant the Apple Macintosh but now includes other makes, models and operating systems. BMUG supports many Special Interest Groups (SIGs), an eight-line Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, seminars, and much more. BMUG also puts out a semi-annual 400+ page book that we call our "newsletter."

Our motto continues to be: W*e're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6:00 to 9:00 pm (or whenever we finish), in the Physical Sciences Lecture Hall on the U. C. campus.

The BMUG HelpLine, (415)849-HELP, and our fax number, (415)849-9026, provide technical assistance and telephonic hand-holding for members during business hours (11:00 am - 5:30 pm). If your question can't be answered on the spot, we try get you in touch with someone that can help. Of course, not every problem can have a happy ending — but we try.

BMUG has one of the most up-to-date, comprehensive software libraries around, with 400+ double-sided disks filled with the latest versions of public domain or shareware programs and *HyperCard* stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the *PD ROM™ 2.0*, our entire library and more on CD-ROM — according to Apple, it's the best selling CD-ROM!

Our BBS offers many of the latest versions of files in our software library, as well as news, private mail, rumors, etc. The BMUG BBS is part of the worldwide EchoMac Network on FIDOnet (161/444); by calling a local FIDOnet BBS in your area, you would then be able to get in touch with us wherever you are as well as send mail to users everywhere! BMUG is now a part of the international USENET network (apple!bmug!firstname.lastname@sun.com) or (firstname.lastname@BMUG.FIDONET.ORG). With our multi-line capability you are now able to have access to BMUG almost 24 hours a day. It's easy to use, fun, and a great resource.

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Virus Special Interest Group Alert:

A couple of new viruses are floating around the Macintosh world right now. One is a variant of an old favorite and the other is a novel nasty bit.

The first new virus is a variant of the *nVIR B* virus, *Jude.* There are many forms of the *nVIR* virus, and most commercial and shareware anti-viral software will catch them. The latest versions of publicly distributable bug catchers are on BMUG *Utilities 8* disk.

The second new Mac virus is a real piece of work, called *WDEF.* It has been discovered in Belgium, and at several universities in the U.S.

W*DEF* doesn't work by attacking the System file; rather it infects the invisible Desktop files used by the Finder. Every Macintosh disk, hard and floppy alike, has one of these files. The virus spreads from Desktop file to Desktop file, but doesn't attack applications, data, or system files.

So what's the harm? The virus doesn't intentionally try to do any damage, but due to several bugs, the virus causes crashes. It also reportedly creates severe performance problems on infected AppleShare servers.

Since the virus is stored in the Desktop, the cure is simple—rebuild the file! When starting the Mac, or before inserting a floppy disk, hold down the **Command** and **Option** keys. This should be done on all hard disks and floppies used on your machine.

None of the current crop of anti-viral protections will prevent *WDEV* infection. The Desktop file is changed too frequently to allow software or users to regularly interfere with its actions. *Virus Detective,* a shareware desk accessory, can be configured to search for the virus.

the building blocks of software, while being aware of the possibility of laboratory errors. Some of the hardware setups at the office are lovingly maintained, but are not always reliable. BMUG is also the testing site for an often confusing jumble of utilities and software add-ons.

Greg felt he had discovered a virus on a copy of *MacPaint* someone had sent in. Further analysis on his Mac at home revealed that the program had a corrupted resource fork. Most supposedly infected programs have a part that has not been replicated correctly—in this case a resource. Some changes are not fatal to a program, while others can cause a system crash, or even ruin documents.

Virus checking gives researchers a lot of practice comparing files, especially the System file, a major target of infection. Greg said that common practices can fool hunters looking through the microscope.

Small actions that any user might perform every day, and not give a second thought to, can produce changes in the System. Dragging the Control Panel's window will do it, since Apple saves the window's position in the System file, instead of using a preferences file.

Greg also said that he had been worried about a new fPRT resource that had been added to a system. It turned out to be the place where your page setup preferences are stored. When your Mac comes out of the box, it doesn't have this resource. But when your application goes to print, the preference resource code is added to the System file.

We're starting a list of names for any future viruses BMUG discovers. The current leader is nEMA. If you have any suggestions send them to Greg at the BMUG office.

MAC @ WORK

Bytes And Pieces

Yet another Microsoft *Word* tip. *Word* is a powerhouse, but it can't do everything—yet. Features like Times Italic with Optima Bold Oblique. *Word* does not have an easy way to accomplish this, other than its regular **Find/Replace** command. This can be very tedious in a large document. *FullWrite* and *MacWrite II* have this ability built-in.

There's a hack to get around this. First save your file in the Interchange RTF format, then open the new version as a plain-text file. At the top of every RTF file, there's a header section called fonttbl, or font-table, where a correspondence between font numbers and font names is established.

The font information for each font is expressed as a set of numbers and letters surrounded by brackets. The Chicago font combination might read, {\f0\fswiss Chicago;}.

Word lists every font in your system, whether you used it or not. Changes in the fonttbl section will change the fonts throughout the rest of the document. Replace the number that refers to one font with that of another. It's easy!

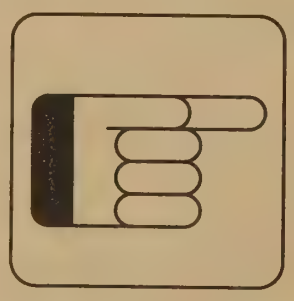
Save the results as text only, close the file, and then reopen it. If all goes according to plan, *Word* will ask if you want to interpret the RTF. Click yes, and you're cooking for hungry mouths waiting at the font table.

Apple has warned developers to ignore font numbers and look for font names. Microsoft has chosen to ignore this instruction. Remember that the font-table built in the RTF header is specific to your Mac's system—the numbers can change if you head out to the laser parlor.

Style Sheets, pre-set font and attribute combinations, reward methodical users that can think ahead, but leave follow-your-nose mud-pie makers behind.

Have you ever wanted to replace every occurrence of a particular font and attribute combination with another? Perhaps change every occurance of

• Apple has had nothing but trouble with the Quantum 40 and 80 megabyte drives. Now it's having trouble with the 20 megabyte MiniScribe drives installed in the Mac SE. BMUG sources report a colossal 12% failure rate on the drives. The MiniScribe drives had a history of reliability, but were considered to be the noisiest of the Apple drives. They're now indeScribe-able! ■



Shareware Spotlight

The longer one uses the Macintosh, the more one becomes accustomed to the Bomb. When we first start working and playing with our software, a crash is a nightmare out of the blue. Sometimes we blame ourselves. After a while, though, the little bomb box is expected—not welcome, but not unknown.

Have you ever wondered what the little error identification numbers in the bomb box meant when you crashed? It will say "id=15"—say what? An easy way to discover the meaning of these codes is to use the *System Error Table* desk accessory. It lists all the codes and what they stand for. Id 15 is a dsLoadErr, or a Segment Loader error, when trying to read something from a disk. Does that help you? Maybe not, but it might make you feel better!

The *System Error Table* DA is on BMUG DA 3 disk for $4.

UpComing Events

January 4 Bogas Productions' *Studio Session,* Kennect *Rapport* (disk drive).
January 11 David Bunnell.
January 18 ProPlus Software's *Wall Street Investor,* Sony Read/Write Optical Drives.
January 24 *IdeaFisher,* RagTime USA's *RagTime 3.0.*
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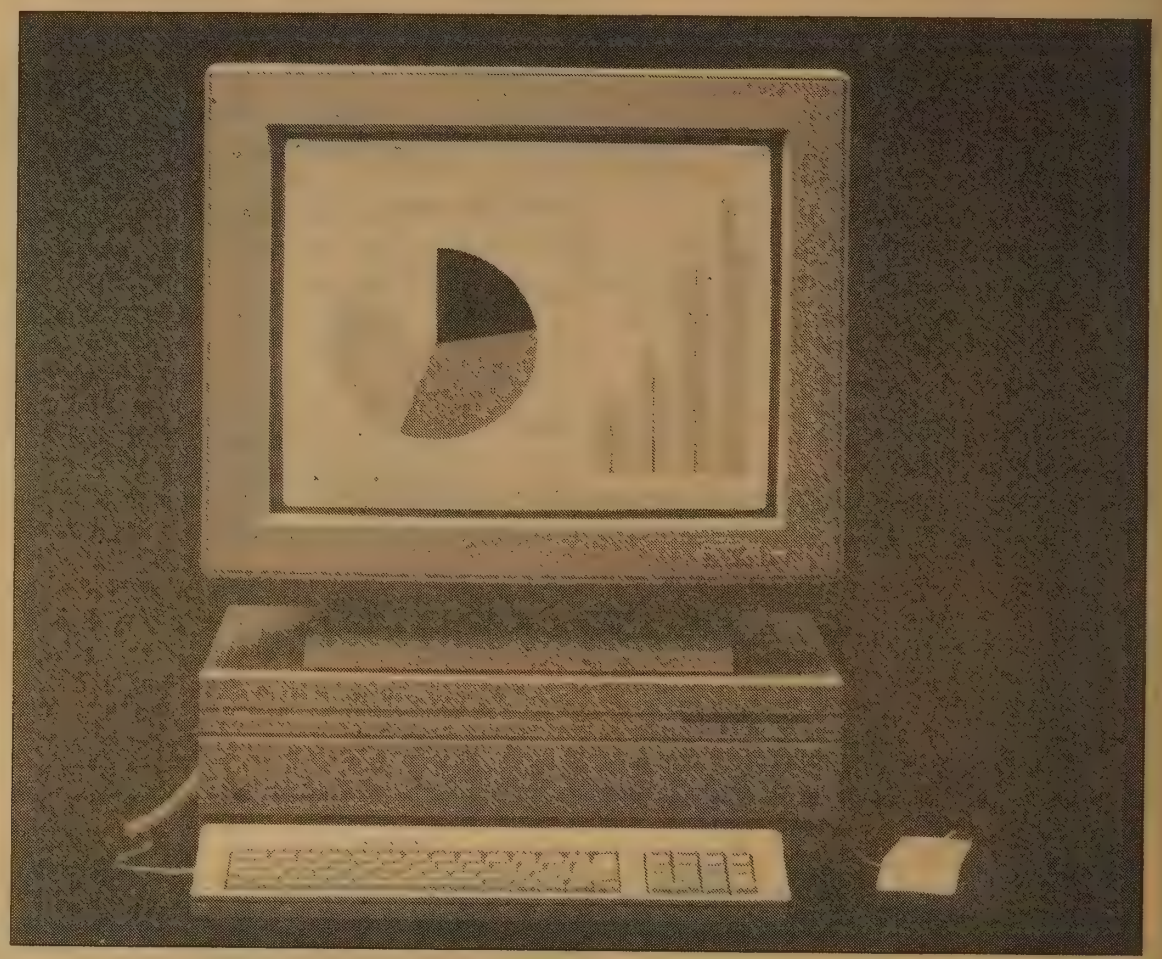
MAC GRAPHICS BUYERS GUIDE

RasterOps Introduces Large Monochrome Display

RasterOps has introduced its first entry into the monochrome display system marketplace with a 19-inch monitor for the SE and II. Running at 1024 x 768 pixel resolution and 72 dpi WYSIWYG, the system operates at 72 Hz for a flicker-free environment. And the Macintosh SE display system is designed to update the screen at twice the rate of competing displays. RasterOps Corporation, 10161 Bubb Road, Cupertino, CA 95014. (408)562-4200.



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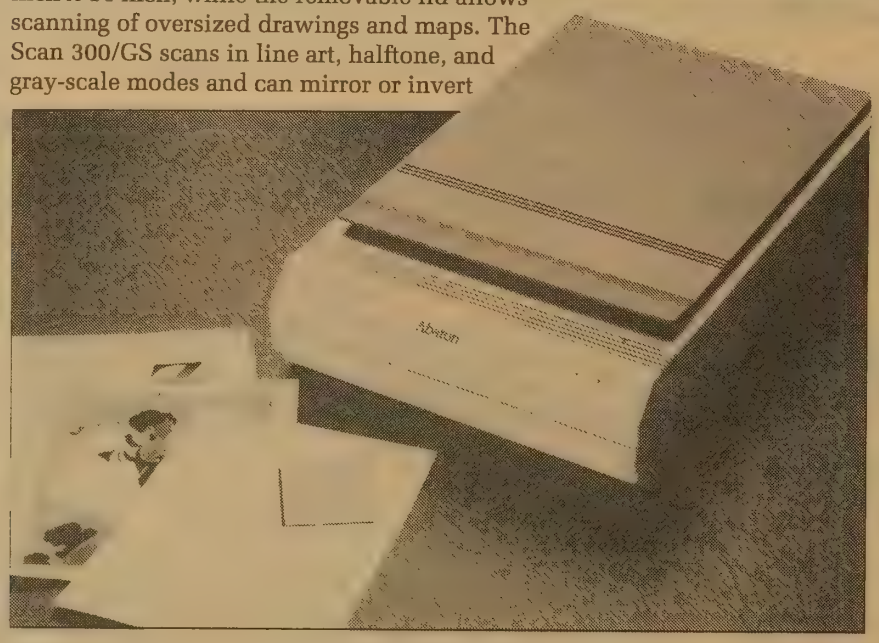
The Scan 300/GS scans in 256 levels of gray and is compatible with the full line of Macintosh computers as well as PCs and compatibles. The flatbed design of the Scan 300/GS facilitates accurate alignment of documents up to 81/2 inch x 14 inch, while the removable lid allows scanning of oversized drawings and maps. The Scan 300/GS scans in line art, halftone, and gray-scale modes and can mirror or invert



images as they're scanned. It offers 255 brightness and 255 contrast settings as well as independent horizontal and vertical resolution of 75 to 300 dpi. Optional software for the scanner includes a variety of tools for manipulating scanned images. *Scan DA* is a desk accessory that lets users scan images from within any application. ($1795 for the scanner; $395 for the software) Abaton, 48431 Milmont Dr., Fremont, CA 94538. (415)683-2226.

Publish It! Is Fully Integrated DTP Package

Publish It! from Timeworks is a fully self-contained desktop publishing program that includes advanced page layout, fully integrated word processing, and drawing, painting, and editing capabilities. The application is designed primarily for corporate and home office use, and enables both professional and novice business communicators to write, design, and produce dynamic documents. *Publish It!* is the first desktop publishing program to include text rotation in one degree increments, patterned text, text wrap inside any object, V, pyramid, and slant margin formats, eight overlap modes, page magnification from 12 percent to 800 percent, and movable pica and inch rulers. Its word processor includes a 240 thousand-word thesaurus and a 160 thousand-word spell checker. ($395) Timeworks, 444 Lake Cook Road, Deerfield, IL 60015. (312)948-9200.

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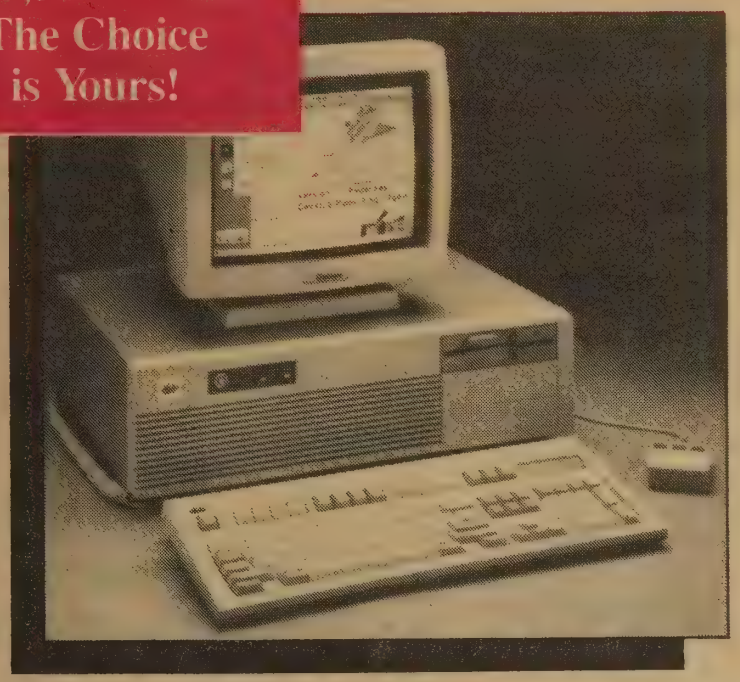

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BY BROCK N. MEEKS

Truth, Technology, And The Revolution

Once before, this column managed to meld the topics of telecommunications and guerrilla warfare, and it's about to do so again. Only this time the focus isn't on bullets or blood. No, this time it's a war of fax and of facts, or a lack of them as the case may be.

In case you haven't noticed, the fax machine has become the propaganda tool of choice in various third world conflicts. For the sake of space and clarity we'll look at only three examples: China, the Middle East, and Afghanistan.

Faxing Advances

Sitting in the cramped and dusty Peshawar, Pakistan headquarters of the Afghan rebel political party known as the Jamaat-i-Islami, a fax machine only a few feet away from me began to spit out a message from the front. I couldn't see any identifier from the sending fax. It was anonymous, a renegade, a rebel, like all the other rebels in the room. I remember scribbling in my notes something about "guerrilla technology," but left it at that. Something wasn't quite right. The atmosphere in the room was too calm.

In a country where private ownership of fax machines was only recently granted (April of 1989 to be exact), I was stunned to see such calm acceptance of the customary screech and twitter of two communicating fax machines. None of the Afghan rebels seemed particularly astonished, and when I questioned one of the nearby rebel commanders he simply grunted the word, "News."

News indeed. Reading the fax, written in a halting hand and broken English, the message said: "Jalaluddin Haqqani, great commander of Afghan people, has captured government outpost...many gov't troops captured. Heavy fighting but all now OK. We cry for lost lives but hope or message of victory spurs people and western nations to support the jihad. We know that many try and tell lies about our goings on. We hope they do not believe them."

As I scribbled down the message, I wondered how many other fax machines were in use by the rebels. "Many fax machines used," I was told by the Jamaat political officer. "Many sent from the West for our use."

But I let the odd scene pass, the notes left buried in my journal. Heading to the front where the real fighting was occurring took top priority, until months later when another use of fax machines in an uprising struck an all-too-familiar chord: when the Chinese students took over the square.

From China the students sent faxes by the hundreds, providing up-to-the-minute details, live from the square. Supporters from the US and around the world similarly sent words of encouragement and strategy via the same faxes. In the midst of horrendous turmoil and upheaval we saw the birth of the "techletariat."

Suddenly all bets were off; it seemed that George Orwell was wrong and Alvin Toffler was right.

A June issue of *US News & World Report* heralded the rise of "a vast network of people and ideas—a Fax Americana—that can penetrate even the darkest corners of the Middle Kingdom." *Newsweek* went further in describing a "revolution by fax machine, computer and word of mouth, by photocopier and wall poster, by direct-dialed phone calls (who would ever have thought of Ma Bell as a revolutionary?), shortwave radio and letters in the mail." Meanwhile, a low-tech transportation device, the helium-filled balloon, carried a mid-tech medium (prerecorded cassettes) across the Taiwan Strait.

And all the while, students in this country were jumping on the USENET, disseminating megabytes' worth of information in just a 24-hour period. From USENET to BITNET to fax machines throughout China. The network worked. Maybe it worked too well.

Technology Battles Technology

During the China uprising I remembered a clip I'd saved from an Associated Press story dealing with the Intifada. It mentioned that the Israeli government was considering cutting all phone lines to the West Bank and Gaza strip because the Palestinians were using fax machines to "inflame the Intifada."

According to the AP, the fax machines were being used to cite times and dates for protests. Also, they were being used to monitor Israeli troop movements on an hourly basis. When the Israelis arrived they were often met with unexpected resistance, due to advance warning by fax machine.

But the Israeli government waffled on the idea of cutting basic phone service; their own people needed it, too, and the phones and fax machines remained in use.

Before we all start patting our technologically hip selves on the back, let's flip this Fax Americana and get a good look at its soft white underbelly. The scene isn't pretty and it isn't fun.

In China, phone numbers were flashed across television screens with messages screaming: **Call these numbers, rat on a student.** But our newly born techletariat struck back. Using a fax machine, the numbers on Chinese television were relayed back to the US. Then, through a maze of computer systems and additional fax machines, American citizens were encouraged to call the number just for the sake of *tying up the lines*!

One message downloaded from a USENET posting urged people to "stay on the telephone as long as possible to express their views to the Chinese authorities." It was a play on a familiar AT&T marketing scheme, only this ad copy could read, "Reach out and jam someone." Anyone that's traveled in telecomm circles long enough has more than a few stories of activists (some say pranksters) using a demon dialer modem program to jam the phone lines.

Maybe We Can Save The World

So, is Toffler right after all? That information technology is going to save the world by producing a non-hierarchical democracy? And haven't we heard from various pundits for more than a decade now that if enough information is made available freely and instantly—bingo—instant techletariat?

But before we all start patting our technologically hip selves on the back, let's flip this Fax Americana and get a good look at its soft white underbelly. The scene isn't pretty and it isn't fun.

Information invasions, such as the one we saw on prime time from China, aren't new and they aren't always conducted by the good guys. During the time of the Intifada, a notorious war of information has been waged from the most unlikely of places: an Israeli prison.

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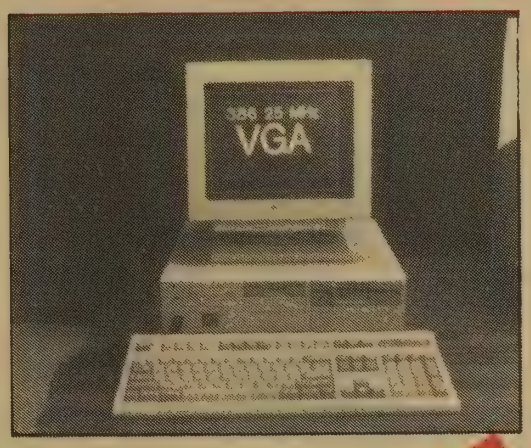

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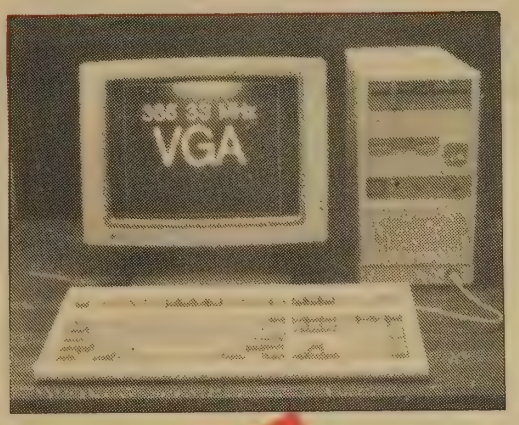

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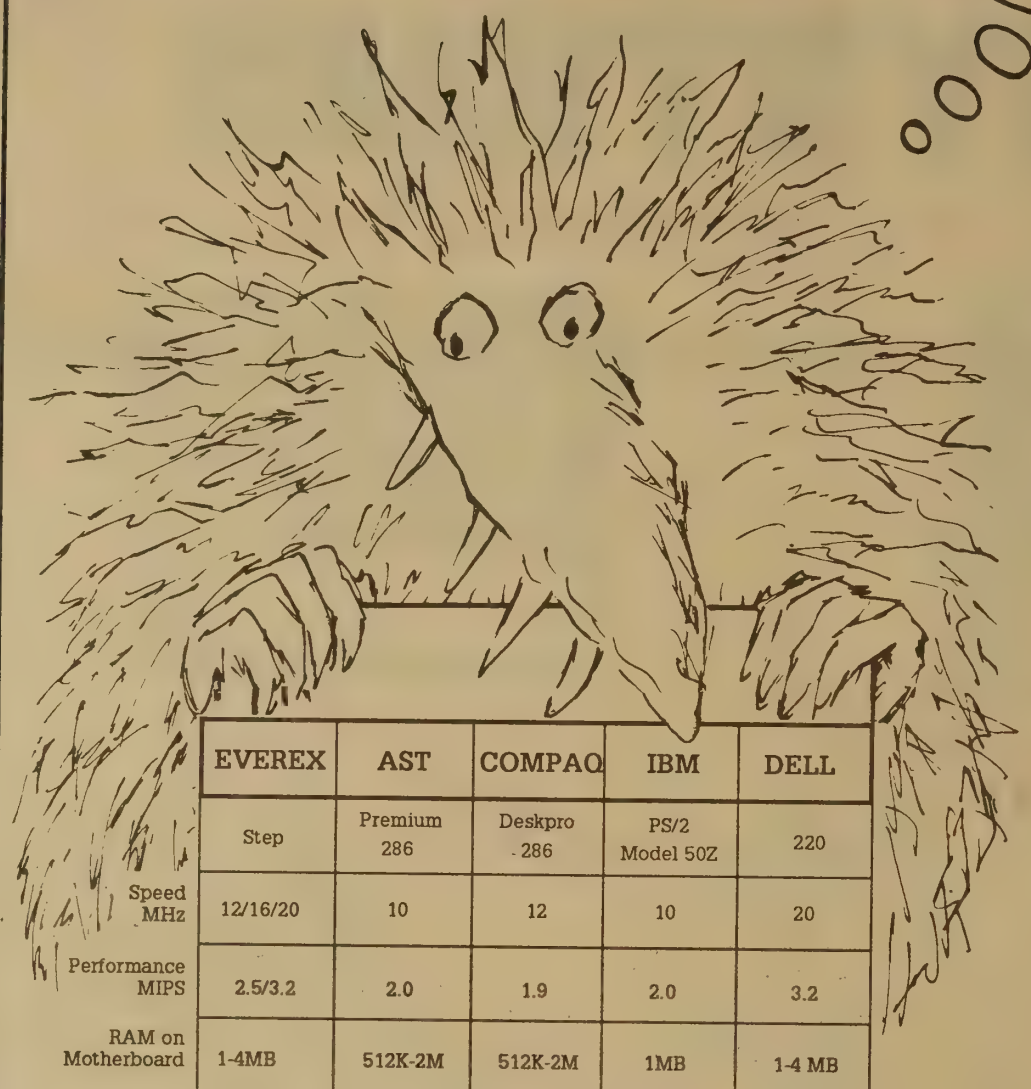

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Programmable LED	Yes	No	No	No	No
Slots/Drive Bay	8/5	8/5	8/5	3/2	3/2
OS/2 Support	Yes	Yes	Yes	Yes	Yes
Warranty	1yr on-site	1yr carry in	1yr carry in	1yr carry in	1y on site
386 Expandability	Yes	Yes	No	No	No
AMMA Cache	Yes on 28620	No	No	No	No

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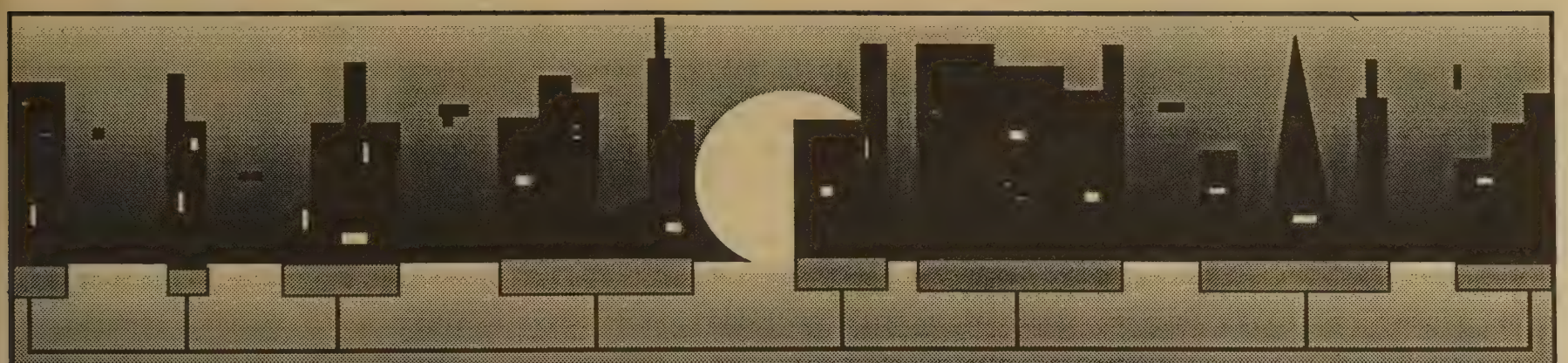

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Youths arrested for taking part in the Intifada are thrown into prison for a short time. During their stay in jail they learn from hard core terrorists the tactics that they will eventually use when they return to the streets. What happens is a kind of saturation bombing of the younger population—not with missiles, but with audio tapes, of home-grown terrorists' how-tos.

Also, the West, regardless of its freedom of information, is not above laying a heavy hand of censorship on information dissemination, as the Chinese government has done in the aftermath of its uprising. At this moment there are laws pending in several states that will outlaw the use of fax machines for political purposes; a month before the Chinese cracked down on fax machines for political use, Connecticut passed a law making it illegal to use a fax for political lobbying.

Welcome to the land of the free and the fear of the fax.

And what about the dirty little sins of disinformation? Disinformation may be the plague of the information age; like a bad cold that you just can't shake, it's likely to be around as long as electronic text exists. The scope of disinformation is frightening—with computers and computer-generated text, disinformation not only spreads much faster, but becomes inherently more insidious because computer text is infinitely corruptible.

Again, the Chinese debacle provides a penetrating case history of this. Remember the early rumors of Deng Xiaoping's death? And that Premier Li Peng had been shot by a distraught guard whose family had been shot by troops? Such factoids were gobbled up by the international news media and distributed—untested—on USENET. Emboldened by the news of a supposedly panicking Communist party, the students pressed on in their demands.

However, a few days later, Huang Jing, a Harvard graduate student, admitted starting the rumors. As Jing said in an interview with MacNeil/Lehrer, he made up the lies to try and flush the leaders out of hiding. He also admitted he'd learned the disinformation tactic from the Chinese Communist Party.

With computers and computer-generated text, disinformation not only spreads much faster, but becomes inherently more insidious because computer text is infinitely corruptible.

A month before the Chinese cracked down on fax machines for political use, Connecticut passed a law making it illegal to use a fax for political lobbying.

Then, when the butchery began in the square, we began hearing of "thousands and thousands" of deaths at the hands of the "brutal 27th Army" who were imported from the outer provinces because they were not of Han descent like most of those from Beijing.

Both statements were false. The first made to rally international outrage and the second to inflame a country not known for its racial or ethnic tolerance.

And in the Afghan war, the rebels have finally learned that prudence wins more aid dollars than inflated claims of victory. But during the early years of their jihad, the rebels often claimed that thousands of government and Soviet troops had been killed. However, the facts proved otherwise. Most journalists just laughed off the fanciful kill ratios, and the rebels stood there with no press coverage and zip credibility. (Until various US right-wing propaganda organizations graciously agreed to lend their expertise to the rebels, hence the "greening of the Afghan press"—but that's another story...)

A similar incident happened during a time when international aid was beginning to flag. The rebel leaders caught the ear of our own Congress by proclaiming that the Soviets were dropping landmines from helicopters, disguised as toys. These hideous devices were killing and maiming children by the thousands. Or so we were told. And we condemned the Soviets outright.

Ask to see such a toy landmine and you won't be shown one. Why? They don't exist. The story of landmines disguised as toys is a myth. Furthermore, hundreds of Afghan children have been maimed or killed by landmines laid by the rebels themselves!

Who To Believe?

When the good guys start spreading disinformation, how do you sort out the wheat from the chaff? Easy. You can't. Unless you're right there on the spot or are getting your information from a source you know is creditable, you're placed in an information age Catch-22: who do you use as your information censor/filter?

When disinformation tactics by the good guys start sounding like—smelling like—those used by the bad guys, nobody can be believed.

We, who pride ourselves on the use of telecommunications as a powerful medium are, it seems, forever perched on a razor's edge. First we hail the use of several technologies in the fight for freedom of information, as we did during the Chinese uprising. And in the next minute we find ourselves scrambling to explain away the abuses of the medium.

If this keeps up, what then? The sentiment in the US media swings, loses interest. On to the next dirty little war—or Zsa Zsa Gabor's next court appearance, whichever comes first.

When disinformation is used as a weapon—by both sides—the only casualty is truth. I've said before that we desperately need an "information bill of rights," a document that sets forth the sanctity and impeachability of history as defined and watched over by an electronic medium. If this doesn't happen, if we continue to wing through these early, heady years of the information age without heeding its lessons, well, then Toffler will be proved wrong, and information won't equal power. Instead, power will emanate from the barrel of a smoking gun. ■

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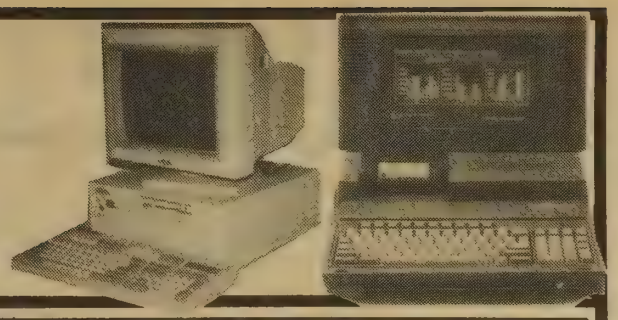

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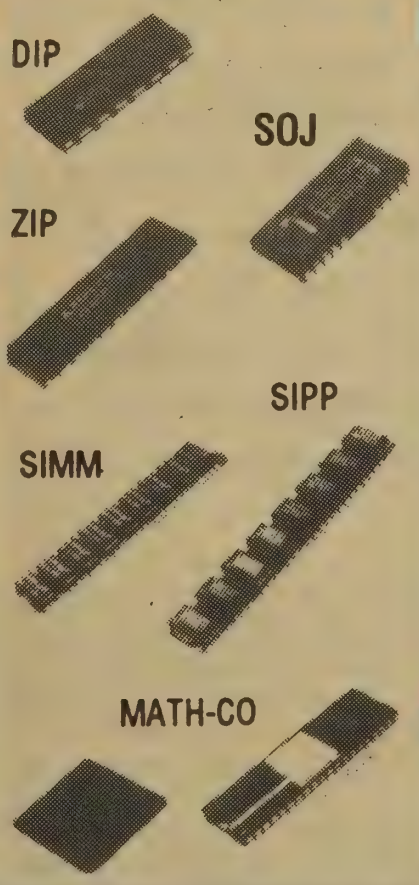

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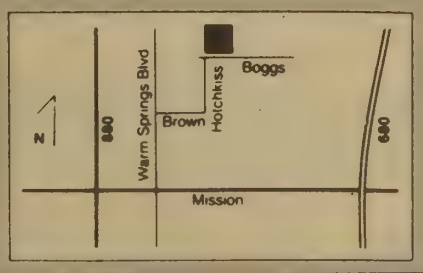

BY DAVID HAWKINS

Spectre GCR: It's Here!

New, Improved Mac-on-an-ST

The Spectre GCR is now available and is being shipped by Gadgets by Small, Inc., 40 W. Littleton Blvd. #210-211, Littleton, CO 80120, (303)791-6098. The fax number is (303)791-0253.

A couple of months ago I reviewed the Spectre 128, which allowed the Atari to run most Macintosh programs. Basically the Spectre is a cartridge that plugs into the ST's cartridge port. It holds the Mac ROMs—which you have to get elsewhere, although they seem to be readily available. The Spectre also contains the software needed to run the programs.

So What's New?

The Spectre GCR is an improvement over the Spectre 128 in that it allows you to use Macintosh disks in your Atari's disk drive. With the 128 you had to somehow move the programs to a specially formatted disk that wasn't Atari format or Mac format. That also meant you couldn't use copy-protected programs, since there was no way to copy those to the special format.

The Spectre GCR is an improvement over the Spectre 128 in that it allows you to use Macintosh disks in your Atari's disk drive. You just put the Mac disk in the disk drive and the program runs. No need for special formatting or elaborate methods of copying programs. And you can run copy-protected programs.

With the GCR you just put the Mac disk in the disk drive and the program runs. No need for special formatting or elaborate methods of copying programs. And you can run copy-protected programs.

Copyright © 1990 by David Hawkins. All rights reserved. *David Hawkins is the host of the Atari conference on The WELL (415/332-6106); send email to dhawk. He has one of the first Atari ST 1040s sold in San Francisco. Both monitors, an Okimate 20 color printer, and disks are all over the room.*

Plug And Play

Dave Small's plan was to produce an easy-to-use Mac emulator. You just plug the cartridge in, turn the computer on, and put a Mac disk in the drive. (Please don't plug in cartridges with the computer on—it can fry chips.)

It is still a very good idea to read the manual, since there are some differences between the Atari and the Mac, and the Spectre can't make the ST into an exact Mac clone. Fortunately the manual is well-written.

If you're used to the Atari, you'll have to learn to do a software eject of the disk before reaching over and popping the disk out of the drive. If you are used to the Mac, there are a few other differences that will stand out.

Stacy Meets Spectre

The GCR works with the Stacy—the portable Atari ST. I don't think I've mentioned the Stacy earlier. I haven't played with a review copy yet, so these are just the statistics on it: it's 15 inches wide by 13.3 inches deep and about four inches thick. It's ST compatable—not IBM/DOS compatible like the Portfolio. It's available with 1, 2, or 4 Mb of RAM and has a 720 K 3 1/2 inch disk drive. It's also possible to get a 20 or 40 Meg internal hard disk and various external disks are available also.

You can use the Spectre because it does have a cartridge port as well as the MIDI ports. It's also possible to hook up external monitors to it. It uses 12 C batteries and/or a DC input jack.

Note: the Stacy is not the Portfolio, which is Atari's new IBM/DOS portable.

Conclusions

If you already have an Atari ST, the Spectre GCR is great if you want to run Mac programs. If you don't have a computer, then buying an Atari and a Spectre GCR allows you to play with two separate worlds of computer programs—and save money doing it.

If you already have an Atari ST, the Spectre GCR is great if you want to run Mac programs. If you don't have a computer, buying an Atari and a Spectre GCR allows you to play with two separate worlds of computer programs—and save money doing it.

Spectre isn't perfect yet. There are still some small bugs being found and fixed. Also, Mac MIDI programs do not work on the Spectre since the Mac uses different sound chips.

My personal preference is for running just Atari programs. But if you think the Spectre is what you want, stop by your dealer's, or go to an Atari users meeting, and see a demo.

WordPerfect Update

WordPerfect recently announced a new update. The new version is supposed to be faster and includes fixes for various printing bugs. It also adds new printer drivers, including the DeskJet series. The upgrade also handles Ultrascript and has improved PostScript printer support. It does a running word count during a spell check and shows the available disk space when you're listing files.

If you have features you'd like to see in future releases of WordPerfect, write to WordPerfect Corporation, Atari Development, 1555 N. Technology Way, Orem, Utah 84057. ■

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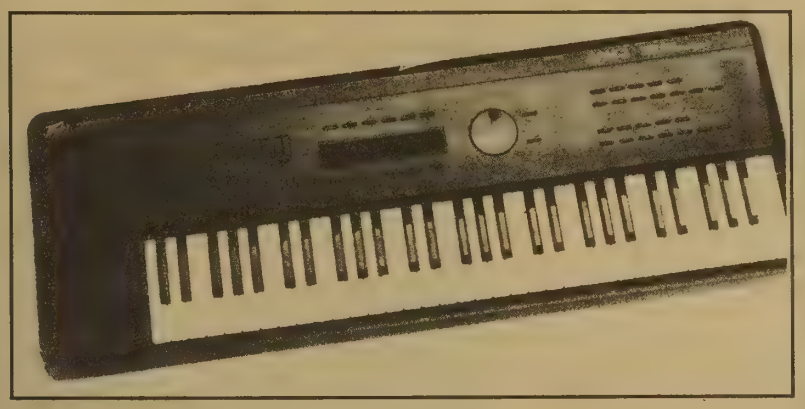

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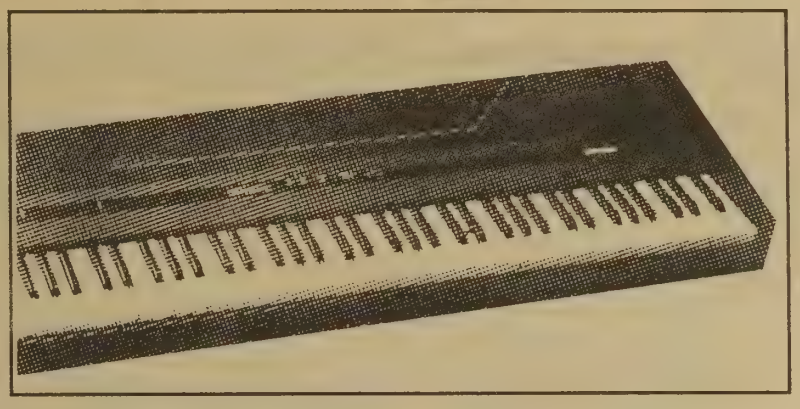
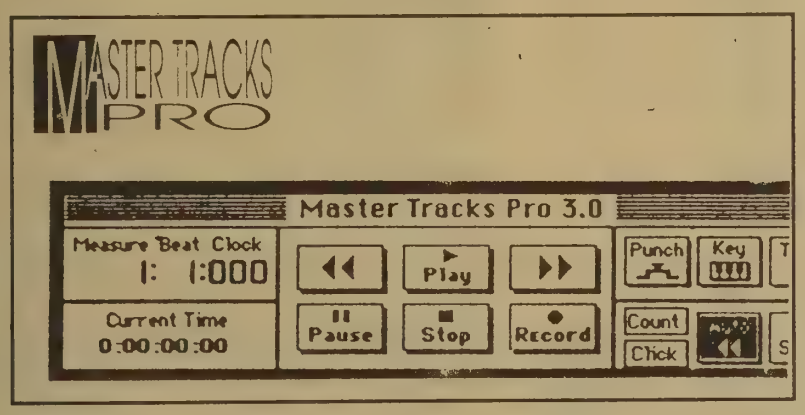


Kurzweil K1200

The K1200 is an 88 note version of the Kurzweil K1000 Special Edition, but with two very important additions: The K1200 contains *8 megabytes* of Kurzweil ROM samples for the greatest selection of sounds ever offered in one unit, plus a powerful set of operating system upgrades, including multi-channel MIDI control zones. **FEATURES:** • Over 250 all-new setups based on the K1000 *Base Block* (grand piano, choir,strings, organ, brass, and many more), *KXA* (electic piano, drum kits, flutes, basses, and synth waveforms), plus *KXB* (marimba, harp, percussion, 6-string, tenor sax, and distorted guitar) • Velocity-sensitive, weighted 88-note keyboard with monophonic aftertouch • Three programmable MIDI regions/layers with independent channel assignments • Foot-pedal actuated program increment/decrement • Programmable MIDI panning for real-time effects • Velocity maps (preset & programmable) and master transpose settings output to MIDI • Advanced operating software features, including expanded control source list, bin banks, enter/compare function, and multiple level programmability.



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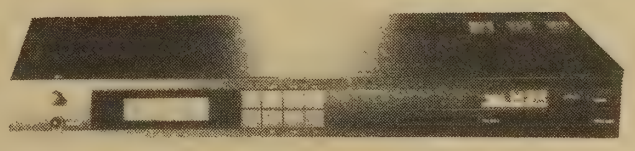

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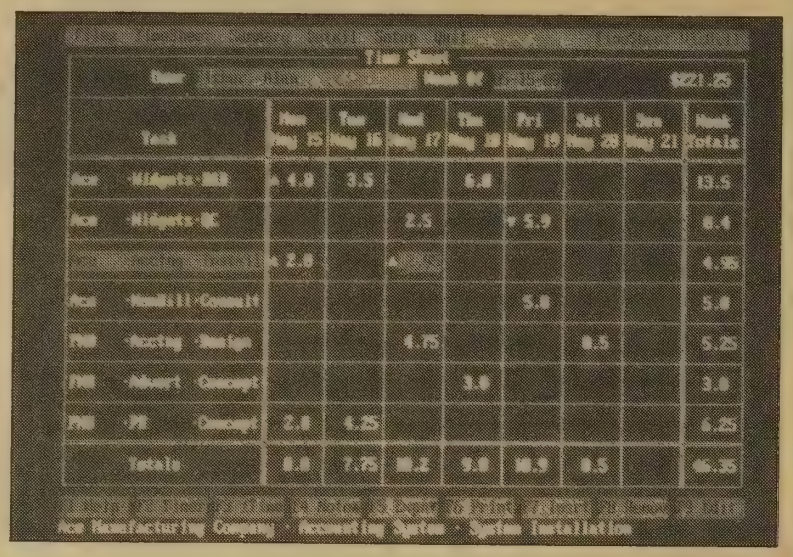
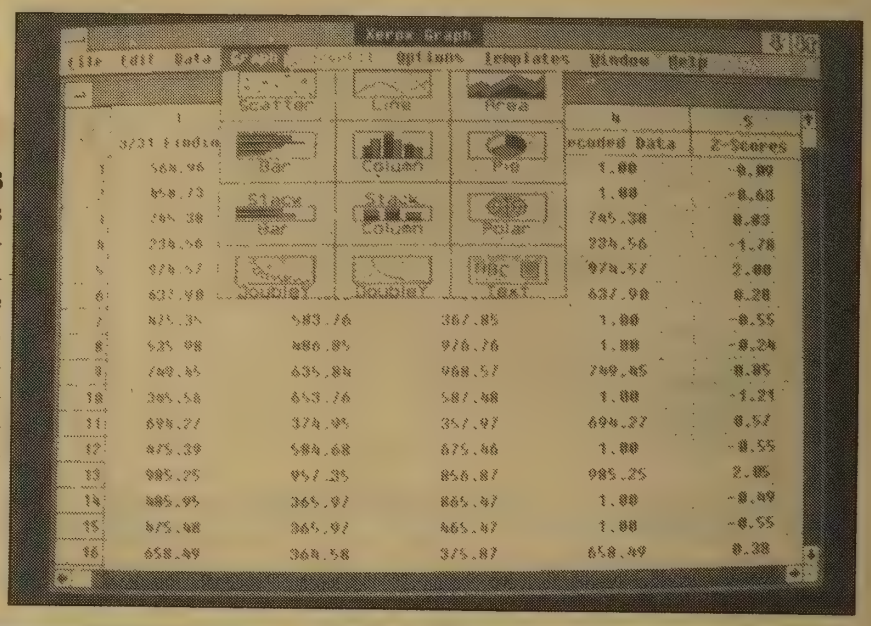


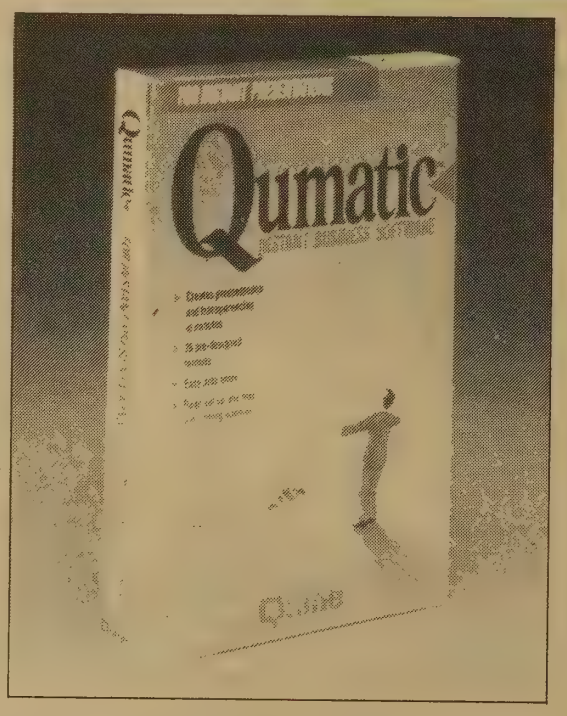
TimeSheet Tracks Time And Expenses

TimeSheet Professional is a time and expense tracking system for project-oriented companies and consulting professionals. The product tracks and summarizes project or client-specific activity for better project management and improved productivity. The time sheet provides a week-at-a-glance view of all projects and tasks. Time can be directly entered onto the time sheet and with a "stopwatch-timer." *TimeSheet Professional* reduces the time required to record and analyze client and project activity. It produces multi-level views by project, client, or activity, allowing users flexibility in organizing and reporting tasks. ($149.95) Software Partners, Inc., 999 Commercial St., Palo Alto, CA 94303. (415)857-1110.



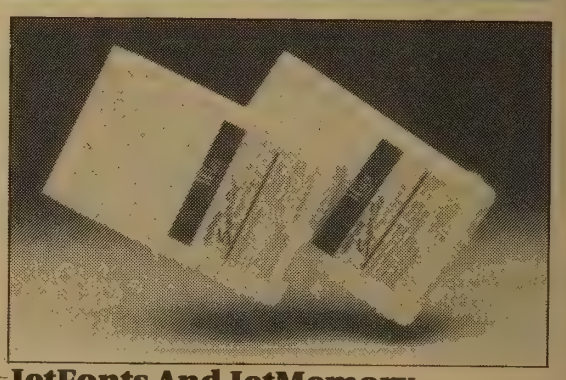
Xerox Graph Combines Data Analysis, Graphs

Xerox Corporation has introduced a package designed to transform business and technical data into understandable information that people can visualize and act upon. *Xerox Graph* combines sophisticated data analysis with the ability to create an extensive variety of full-color or black and white graphs. This software is intended for use by financial or statistical analysts, engineers, scientists, market researchers, and others who must work with numerical data, as well as by developers of business reports and presentations. *Xerox Graph* operates under Microsoft Windows, and a runtime version of Windows is included with the package. Data from a number of different file formats may be imported into *Xerox Graph*, including *Cricket Graph* 1.2 for the Macintosh, Lotus WKS, WK1, and WK2, Microsoft SYLK, and DIF. ASCII text may be imported as well. Graphs created with the software may be exported as a Windows Metafile to Xerox *Ventura Publisher* and *Xerox Presents*. Xerox, 1-800-822-8221.



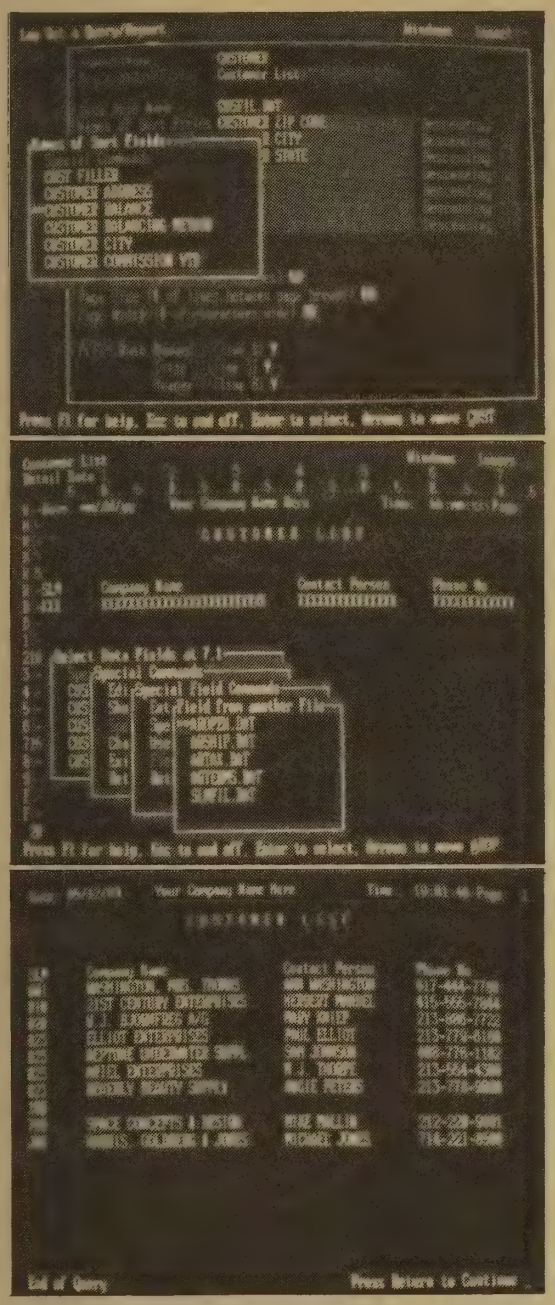
Qume Announces Business Solution For Home And Office

Qume Corporation has introduced the Qumatic Instant Business Software product family for PC and compatible systems, including four separate but related packages designed to simplify everyday business tasks. Each software package, including Instant Presentations, Instant Forms, Instant Assorted Labels, and Instant Mailing Lists & Labels, was created to do a single task well and take only minutes to learn. Qumatic Instant Business Supplies include a diverse selection of laser transparency film and assorted labels for all types of laser and continuous-feed printers to complement the Instant Business Software. Professional-looking text presentations and overhead transparencies can be created simply and quickly using Qumatic Instant Presentations and a personal computer connected to an H-P LaserJet Series II or compatible laser printer, or a dot matrix graphics printer. Qumatic Instant Forms provides pre-designed, essential business forms including invoices, purchase orders, statements, sales orders, and facsimile cover sheets. With Qumatic Instant Assorted Labels, a wide variety of labels for business applications can be produced, from name tags to file folder labels to shipping labels. Finally, Qumatic Instant Mailing Lists & Labels allows users to create mailing lists and labels and print them using a dot matrix, daisywheel, ink jet, or laser printer, without complex commands. Each package costs less than $50. Qume, 500 Yosemite Drive, Milpitas, CA 95035. (408)942-4000.



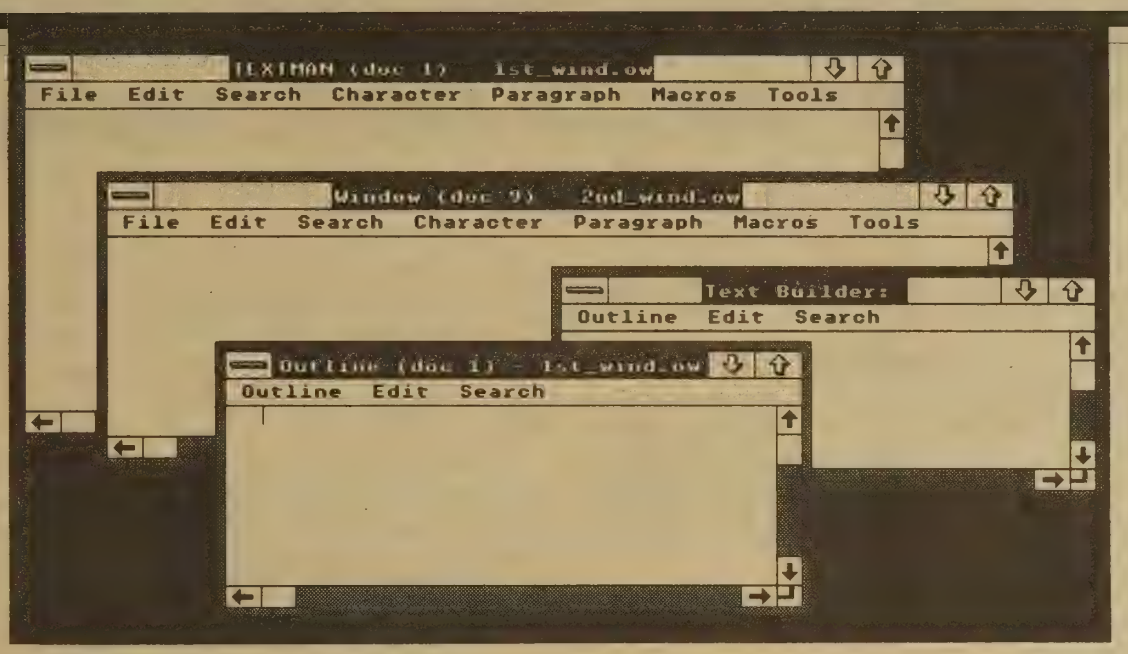
JetFonts And JetMemory Available For The H-P

Computer Peripherals has announced products for the recently introduced H-P LaserJet IIP. The products include a full library of JetFont cartridges offering improved resolution and standard typefaces currently used in the Series II and IID. The JetFont cartridges are offered in portrait mode only in order to efficiently utilize the H-P IIP rotation capabilities. Additionally, the JetMemory products for the H-P Series IIP will include a range of expandable memory boards including 1 Mb, 2 Mb, 3 Mb, and 4 Mb. Current owners of Series II and IID printers may user their JetFont cartridges in the Hewlett-Packard IIP. (JetFont/$195, JetMemory/ $595–1595) Computer Peripherals, Inc., 667 Rancho Conejo Blvd., Newbury Park, CA 91320. 1-800-854-7600.



Report Writer Release Sports New Features

Snow Software's DOS, UNIX, and LAN versions of its new *Snow Report Writer* 3.02 include new features to meet the needs of a new generation of users. When using RM COBOL 85 Native Indexes in sorting and doing lookups, *Report Writer* runs up to ten times faster than before. It can now also look up and merge 15 files simultaneously, and produce report formats that are not limited to column formats. The new version includes pull-down menus, as opposed to commands or passwords (even in UNIX). *Snow Report Writer*, first released in 1987, puts a query facility, spreadsheet link, and report writer in one package. It gives you the ability to read and write to over 150 business applications and languages. *Report Writer* runs on DOS, UNIX, XENIX, ULTRIX, LAN, NCR Tower, and AT&T 3B2 systems. ($695) Snow Software, 2360 Congress Avenue, Clearwater, FL 34621. 1-800-283-7669.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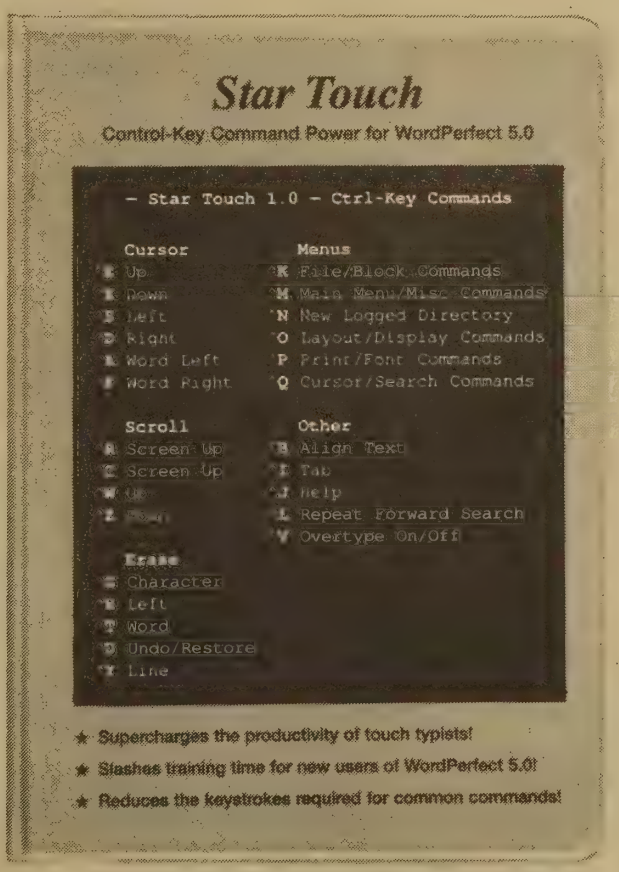


Star Touch 1.0 Provides Control-Key Commands For WordPerfect

Starboard Soft has announced the release of *Star Touch* 1.0, a new program designed to improve the productivity of *WordPerfect* 5.0 users by enabling them to use the Control-Key editing commands made popular by such programs as *WordStar* and *SideKick*. Control-Key commands facilitate touch typing because the hands remain on the Home keys. *Star Touch* is designed for experienced computer users who already know traditional Control-Key commands and want to exploit that knowledge. It increases the typing speed of experienced *WordPerfect* 5.0 users and sharply reduces the training time for new users of the application.

Star Touch is written in the *WordPerfect* macro language and functions as an integral part of *WordPerfect*. Menus are displayed only when called by the user. The program does not interfere with the use of *WordPerfect*'s regular commands. It increases memory requirements by approximately 32 K. ($19.95) Starboard Soft, 1125B Arnold Drive, Martinez, CA 94553. (415)372-5304.

BY BENNETT FALK

Making Sense Backwards

Reverse-Engineering "Rev"

Four gurus sat around a table at the Yreka Bakery drinking coffee and indulging their fondness for palindromes.

A nervous young man approached their table and cleared his throat.

"Excuse me," he ventured, "I couldn't help but overhear you talking about computers and about things that are spelled the same forwards and backwards, and it occurred to me that you might have a solution for my problem."

The gurus shifted in their chairs. Some stared into their coffee cups, some rolled their eyes heavenward.

"We only do UNIX," one of them said at last.

"Yeah, I know. I have a computer that runs UNIX and I just got a bunch of files from another system, and when I looked at them, they were, well, backwards, you know, so I need some way to turn the files around."

Another of the gurus looked interested. "Wait a minute," he said. "Are these text files?"

"Yes."

"And when you say they're 'backwards'," the interested guru continued, "what exactly do you mean?"

"Well, each line in the file is backwards. The first character shows up last and the last character shows up first."

"So all you really need," a third guru chimed in, "is to reverse the sequence of characters in each line?"

"Of course. What else could it mean to turn a file around?"

The second guru opened his mouth to reply but under the table there were movements no one could see, and he fell unaccountably silent.

The third guru broke the silence: "No problem. Use the 'rev' utility."

"The 'rev' utility?"

"The 'rev' utility."

"But what does it do?"

"It reverses the sequence of characters in each line of its input. So a line that reads 'sdrawkcaB esneS sekaM' becomes 'Makes Sense Backwards' when run through rev."

"You've got to be kidding. There's really a utility to do this?"

"Yep."

"But why? I mean, I think I have a use for it, but what do other people use it for?"

The interested guru had regained his composure. "'Why?'," he intoned dramatically, "is never a safe question when it comes to UNIX utilities. The manuals explain 'how', but they are silent on the subject of 'why'.

"As to what other people do with it, well, there are some people who habitually reverse any new word or phrase they encounter. Looking for secret meanings, I suppose. Rev is probably a real boon to them. But there aren't a lot of things that make sense backwards, so most folks' use of 'rev' is to amuse themselves by turning perfectly normal text into gibberish.

"In fact you may be the only person in the history of UNIX who has actually needed 'rev'."

"Really? Well, uh, I guess I'm flattered. Thanks for all you help. I've gotta go." And away he went.

The fourth guru spoke for the first time: "He'll be back, you know."

"Why?"

"About the only place you can find 'rev' these days, is in Berkeley UNIX. XENIX and System V don't have it. And I'll bet he's not running Berkeley UNIX."

"Oh, dear," someone else sighed, and the gurus ordered another round of coffee.

Thirty minutes later the nervous young man was back waving a big book in one hand and looking more than a little upset.

"Hey," he said, "are you guys making fun of me, or what? There's no such thing as the 'rev' command. Whenever I type 'rev' my computer says 'rev: Command not found', and look at this manual, there's no entry in it for anything called 'rev'. It goes from 'restore' to 'rm' with nothing in between."

"Yeah, after you left we figured out that your system probably didn't have 'rev'. You see, 'rev' only survives in Berkeley UNIX these days. We're sorry for the misinformation."

"Well, that's just great. Now, what am I gonna do with these backwards files?"

The quiet guru looked up. "We could reverse engineer a version of 'rev' for you."

"What?"

"We could write you a program to do what rev does. It wouldn't be all that hard. It only does one thing."

The man with the backwards files was not quite ready to believe that the gurus could do any such thing, but before he could voice his misgivings, the four experts were chattering away, scribbling things on paper napkins.

"'Rev'," one of them said, "is basically a variation on 'cat': it copies its input to its output, only somewhere in between it reverses the sequence of characters. So let's start with a very simple version of 'cat'. We'll call it 'dumb_cat'. The source code, 'dumb_cat.c', is pretty minimal. It looks something like this."

"I have a computer that runs UNIX and I just got a bunch of files from another system, and when I looked at them, they were, well, backwards, so I need some way to turn the files around."

A hand clutching a paper napkin shot out in his direction. On it was the program that appears in Listing 1.

"There's a 'main' function that reads the standard input one character at a time, assigns the character read to a local variable (named 'c' in this case), and then copies that variable to the program's output. When the read indicates that the end of input has been reached, the program exits.

"Notice that this really simple version of cat just reads standard input. If you want it to work on files, you have to re-direct the input like this:

```
dumb_cat < filename
```

where 'filename' is the file you want copied. Okay?"

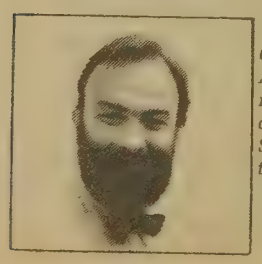
The young man nodded his head tentatively.

Another voice from the knot of gurus picked up the explanation, "Now let's turn dumb_cat into a program to turn lines around. We'll call the new program 'dumb_rev'. First off, we know this new program can't write anything out until a whole line has been read, so we have to allocate a place to store all the characters we've read.

"Let's call it 'inbuf'. How long a line do you expect in your files?"

"Huh? Oh, uh, 80 characters, I guess."

"Great, we'll make inbuf an array of 256 characters. We need an integer variable to tell us where we



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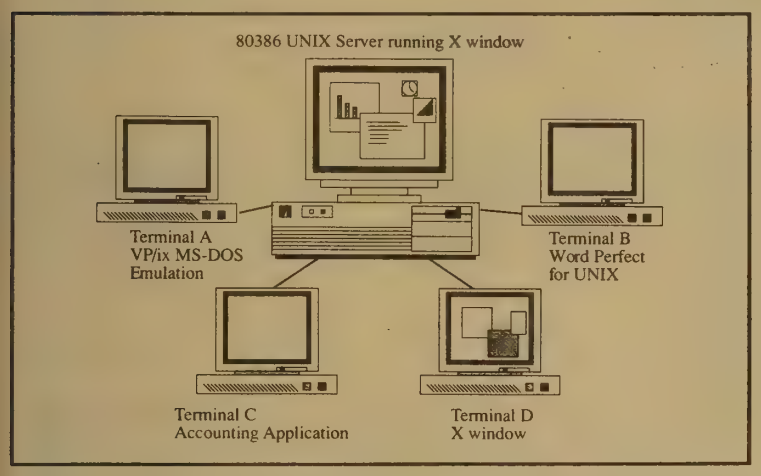

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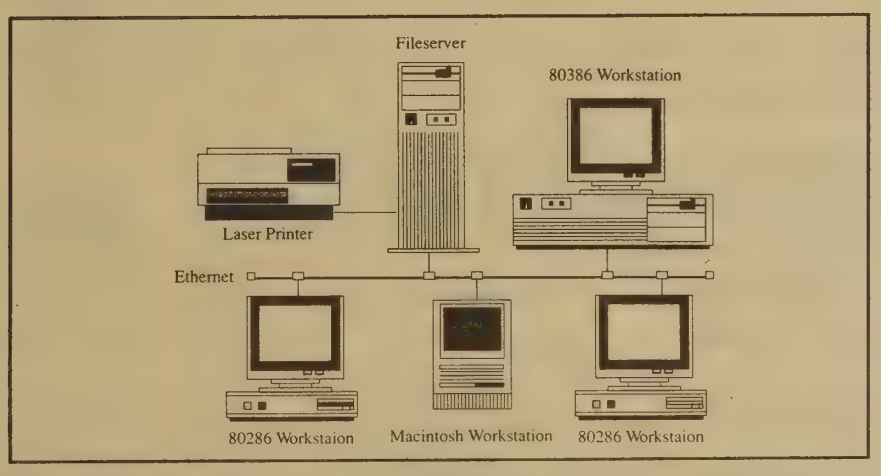

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are in that array. Let's call it 'i'.

"We can leave the condition for the 'while' loop alone because we still want to exit when we get to the end of the file, but the inner part of the loop will have to change some.

"Basically we want to read a character from standard input and store it in the first free position in the character array. When an end of line character is read, that's a signal to print the buffer on standard output, last character first."

"Sounds good to me." The gurus' enthusiasm was beginning to affect the young man.

"There's really only a couple of things you have to be careful with in this program. When you read the end of line character, should you put it in the array or shouldn't you? I mean, if you were serious about reversing the line, you would put out the end of line character first because it's the last character in the input, right?"

"Uh, right?"

"Wrong. If you include the end of line character in the string to be reversed, then there's no end of line character at the very end of dumb_rev's output. This means that if you reverse a file with dumb_rev and then reverse that reversal, you won't end up with a file identical to the one you started with. The safe thing to do here is to put the new line character at the end of each output line."

"If you say so." The guru's enthusiasm was passing him by.

"The other 'gotcha' is that you have to decide whether to increment the placeholder for the array before or after a character is read."

"Why?"

"Well, if you read a character first and then increment the placeholder, when you eventually read a newline character and have to display the line, the placeholder is pointing to an element of the array you haven't assigned yet. You'd have to remember to decrement the placeholder before you started displaying the buffer."

"Uhhhhh...."

"Look, don't let him confuse you," another voice interrupted. "Do it this way and it will work just fine." Another napkin was produced with listing 2.

"All you have to do is put a new line character in the first position in the array. Whenever you read a character from input, increment the array placeholder before you put that character in the array. When you read a newline in the program's input, it's just a signal to dump out the buffer and you don't have to mess with changing the placeholder because it already points to where the last character went *and* there's already a new line in the array."

Silence descended, and the young man stood staring at the two napkins.

"Of course," one of the gurus continued, "you could make this a lot fancier. For example, you could check for input lines larger than the array, and you could add some argument processing so file names could be passed to the program on the command line. That sort of thing."

"I think," the young man muttered timidly, "that this is, uh, plenty for right now, and I just want to thank you guys for all the help you've been. Really. I mean, this is just great, you know." He was backing toward the door. When he felt it behind him, he waved the napkins weakly in the gurus' direction. "See ya around." And he was gone.

After a while the gurus ordered another round of coffee and noted with satisfaction that, for whatever reason, the young man did not return. ■

Listing 1.

```
/* dumb_cat.c */
#include <stdio.h>

main()
{
   int c;
   while ((c = getc(stdin)) != EOF)
   {
      putc(c, stdout);
   }
}
```

Listing 2.

```
/* dumb_rev.c */
#include <stdio.h>

main()
{
   int c;
   char inbuf[256];
   int i = 0;
   while ((c = getc(stdin)) != EOF)
   {
      if (i == 0)
            inbuf[i] = '\n';

      if (c == '\n')
      {
            while (i >= 0)
            {
                  putc(inbuf[i], stdout);
                  i—;
            }
            i = 0;
      }
      else
      {
            i++;
            inbuf[i] = c;
      }
   }
}
```


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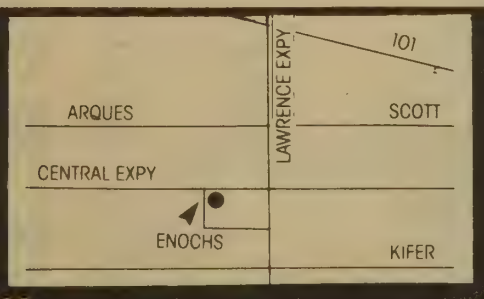

BY WAYNE YACCO

LANs At COMDEX: IBM-Microsoft Challenge Novell

The LAN wars are heating up. This year's COMDEX featured announcements by both Novell and IBM-Microsoft. Yes, that's a new hyphen in the LAN arena. IBM and Microsoft have agreed to converge their respective LAN packages, LAN Server and LAN Manager, into identical products sometime in the future. This is a major development and may pose a serious threat to Novell's dominant position in the market.

It could make specifying a LAN solution more difficult for the type of user who now buys largely on the basis of market leadership. However, merely providing compatible products won't necessarily take market share from Novell. Part of the equation is in the applications that are available to run on the net. Users will only have a hard choice if the programs they want are regularly released for both networks.

Novell, which shipped NetWare 386 earlier in the year, countered with announcements by several third-party developers, of new products taking advantage of the latest NetWare. Oracle, Gupta and others wrote these versions using Novell's new developer's kit. Novell is promoting the kit in an effort to build a commanding lead in available applications before other LAN vendors even have their latest systems on the shelves. This is undoubtedly a key reason why NetWare 386 was shipped piecemeal beginning with a kernel that developers could use immediately.

Even Microsoft will probably be among those with new packages written expressly for NetWare 386. According to Gupta Technologies' president Umang Gupta, "Microsoft will be doing it at their own peril if they don't support NetWare [for SQL Server]."

DDEX

Meanwhile, network applications continue to expand the realm of possibilities. NetLogic, Inc., though not exhibiting, was privately showing the latest version of its *DDEX* in secluded back alleys. *DDEX* gives users the ability to connect Microsoft Windows applications across the nodes of a network.

Windows will be appearing on more and more workstations—on that you can rely—as time goes by. While there are still many key developers, most notably Lotus, *not* writing for Windows, more and more are. And, in a second IBM announcement at the show, Big Blue finally endorsed Windows as a suitable solution for DIS. So much for PM Lite.

Using *DDEX*, data can be transferred among applications running at different nodes exactly as if between two windows on the same Windows desktop. For example, two *Excel* users could link their spreadsheets and keep both current to changes made on the other. Either of these spreadsheets could contain references to cells in the other and use them in local calculations. Netlogic promises that *DDEX* will provide "instant" networked data-transfer capability for any Windows application that supports the Dynamic Data Exchange (DDE).

There are several other useful features built into the product. *DDEX* includes utilities which allow any number of users to converse across a network in real time. The product also provides network support for a fast multi-node broadcast facility with controllable, secure access.

The program currently supports any network that provides NetBIOS protocols. Forthcoming versions should expand that support to include Novell's IPX protocol. That will dramatically improve *DDEX* performance.

A dynamic-link library and header file for network-application development is available, along with sample *Excel* files which illustrate how to create hot links between spreadsheets. Support is being added for the creation of other non-Windows-based applications. A developer's kit for *Clipper* will soon allow programmers to write their own applications with built-in data transfer links. These links will transfer data across the newtork as transparently as *DDEX* now does for Windows. Among the types of applications that this technology may eventually have an impact on are electronic mail, quote feeds, and trading systems.

The current version of *DDEX*, 1.1, lists for $149 per node. It requires Windows 2.0 or above, 48 K bytes on each workstation and a LAN with NetBIOS support. (Netlogic, Inc., 232 W. 15th Street, New York, NY 10011, 212/989-5051.) ■

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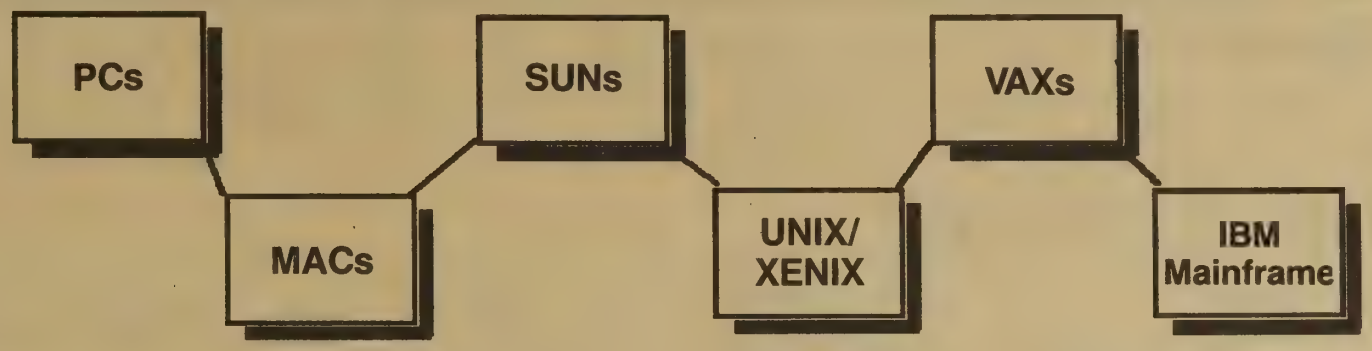

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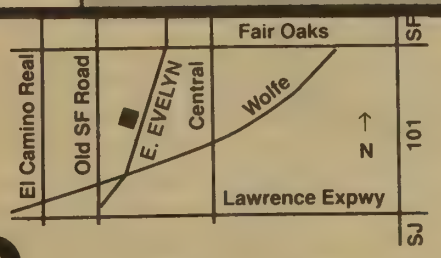

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BY MATTHEW LEEDS

Amiga Shakes

When the Loma Prieta earthquake struck Northern California, the United States Geological Survey office in Menlo Park was right in the middle of things. Not only were they directly affected by the quake, but they were deluged by members of the media for information on the magnitude of the quake, the location of the epicenter, and the likelihood of aftershocks.

Fortunately Steve Walter and Fred Klein, USGS seismologists with a personal interest in the Amiga, had been experimenting with animation software on the Amiga to create visual displays of the information their remote sensing stations were sending in. The day after the earthquake, they created an animation that displayed the distribution of aftershocks during the first sixteen hours after the earthquake. This animation was shown on major network news programs and copied by National Geographic; it and other animations will appear in an upcoming *Nova* segment.

One animation shows an aerial view of the faultline, with the location and magnitude of aftershocks displayed along the fault. The magnitudes are represented by color-coded points of light along the faultline. As you watch, the point of view drops down to ground level—and below, as it also rotates to a perspective perpendicular to the fault line. From this viewpoint you can see the spatial distribution of the points of origin for each aftershock, including their relative depths in the earth.

A second animation uses a digitized relief map of Northern California, in an aerial view. Aftershocks are displayed as circles, with their diameter indicating their relative magnitude. The animation is a time-lapse compression, showing the location and severity of aftershocks from the Loma Prieta earthquake during the first several days after the event.

The original data is collected from the remote sensing stations on a VAX as latitude, longitude, and magnitude information. It is reformatted, on the VAX, as ASCII data in the Videoscape 3D format, and then downloaded to the Amiga. From there, additional information, such as camera angles and camera movements, is added, and then an animation is rendered. Other software packages they've used to create animations include *Deluxe Paint III* and *Page Flipper FX*.

Steve and Fred state that the current process they use to create the animations takes too much effort, but they are working on a method to automate much of the work they currently must do by hand. They believe that once they can speed up the conversion of raw data to a visual display, the Amiga will become a more useful tool in looking for patterns in seismic events.

Seismologists Steve Walter and Fred Klein believe that once they can speed up the conversion of raw data to a visual display, the Amiga will become a more useful tool in looking for patterns in seismic events.

Copyright ©1990. All rights reserved. *Matthew Leeds has been involved in the high tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.*

WordPerfect Maintenance Upgrade

WordPerfect has released the maintenance upgrade to *WP* 4.1. The highlights of the new version include tremendously improved file requesters, direct import of *WP* 4.2 DOS files, and changes to the spelling checker and Print program. It now feels much more like an Amiga program, and in fact introduces some important new concepts in Amiga standards.

The new version of WordPerfect feels much more like an Amiga program, and in fact introduces some important new concepts in Amiga standards.

One of the major problems novice Amiga users have is with the installation of software on a hard disk. The Amiga's operating system does not have a user-friendly way of keeping track of the location of programs and files. Instead, users generally must edit their startup sequence to include one or more Assign statements, creating logical paths to applications and their support files. Although this eventually becomes second nature to power users, it is a big pain, and a stumbling block for those who don't understand the need for this additional step when installing some software.

WordPerfect handles this by using a setup program that you run the first time you use *WP* after installing it on a hard disk. (In fact, they also have a hard disk install program that will not only install all of the needed files and rewrite your startup sequence, but is intelligent enough to ask if you have an auto-booting hard disk or not, as the non-auto-booting variety needs the modifications made to the startup sequence on the boot floppy.) It asks for the path to each of its major sub-supporting modules, and writes them to a parameter file. Should you bypass this step as well, WordPerfect still goes 90% of the way to solve the problem. They throw up a file requester and let you show *WP* the path to the required file.

You may also now run *WP* from the Workbench screen, or a custom interlaced or non-interlaced screen. This lets those users who use FlickerFixers, or have adjusted to interlaced displays, get 47 lines of text on the screen. The new file requesters make use of gadgets for parent/root movement, and also let you cycle from drive to drive via the mouse. There are new requesters for column definition and hyphenation, for setting page length and for printing. The three requesters used for search and replace have been replaced by a single requester.

The update includes three disks and supporting documentation. It is available directly from WordPerfect for a nominal fee, and those users who previously reported problems with prior versions are entitled to receive the upgrade at no charge.

Drawmap

Public domain program of the month is *Drawmap* (*Worldmap*) by Bryan Brown. It draws several different representations of the earth's surface. The user interface is through a pop-up menu. Running the program brings up a blank, high-resolution

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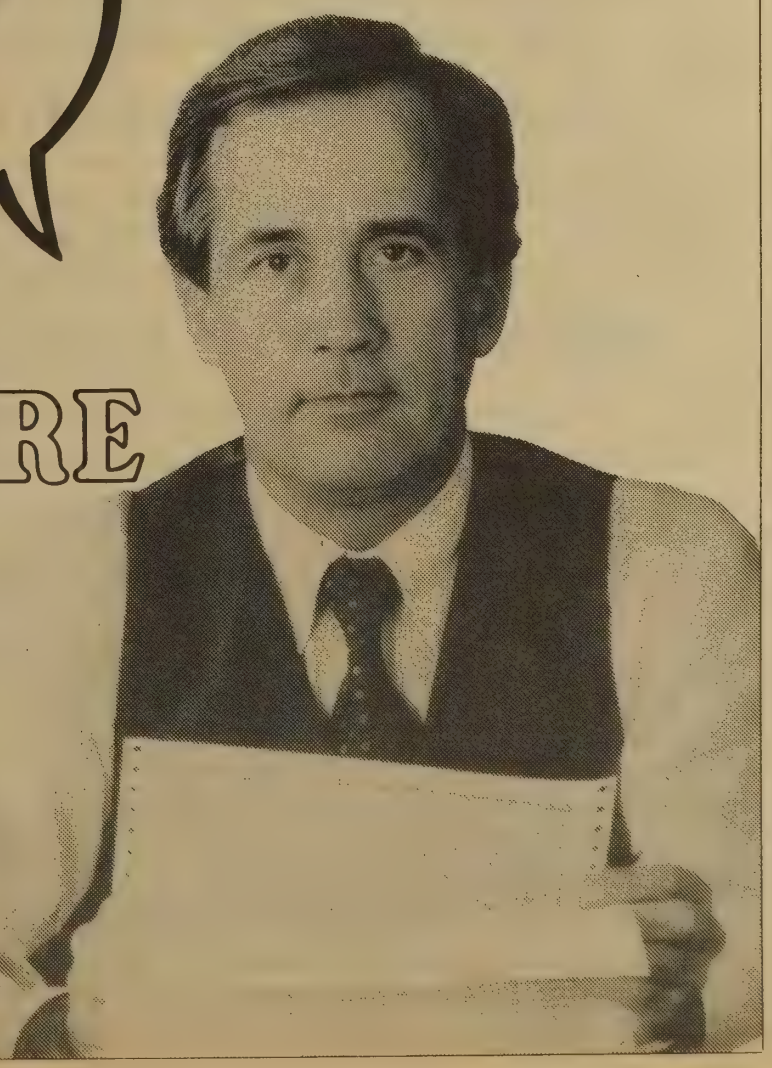

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interlaced window. The user communicates with the program entirely via the mouse. Messages and instructions to the user appear in the window title bar. Pressing the menu button brings up a pop-up window with the following user options:

- Color-Fill—An on-off switch indicating whether or not regions are to be color-filled.
- Flat—Generates a "Flat" map. A "Flat" map is just a plot of the latitude and longitude pairs, without any attempt to preserve areas or make the representation conformal.
- Mercator—Generates a Mercator map, color-filling the continents. This is the standard conformal map.
- Globe—Generates a view of one entire hemisphere of the Earth. If the last view drawn was neither a Flat nor Mercator map, a Flat map is first drawn. The user is then prompted (in the window title bar) to press the mouse selection button to choose the point on the Earth's surface to appear at the center of the globe view. Note that this is a representation of how the Earth would look (without clouds, of course) to an observer infinitely far away, but with a very powerful telescope.
- Orbital—Generates a view of the Earth as seen from an altitude of 300 kilometers. As above, press the mouse select button to choose the point to appear at the center of the globe view. Because of perspective effects, the continents and larger islands appear distorted in this view compared to the previous globe view.
- Zoom In—Generates an orbital view as above, but halves the altitude from which the view is seen. The resulting altitude appears in the title bar. The minimum allowed altitude is ten kilometers.
- Zoom Out—Generates an orbital view as above, but doubles the altitude from which the view is seen. The resulting altitude appears in the title bar.
- Box—Draws a map of all regions overlapping a rectangular box. As the window title bar indicates, press and drag the mouse select button to define the box desired.
- Grid—Superimposes a latitude-longitude grid on the currently drawn map. This option is not allowed for the Box view.
- Flood Fill—Color-fills an area of the map currently displayed.
- Colors—Modifies the colors used to display land masses and bodies of water.
- Clear—Clears the Screen.

Drawmap is an excellent educational tool, as well as very useful in creating maps for a variety of presentational purposes. It lacks the ability to save the generated maps as IFF files, but any screen-grabbing utility can be used for that function.

The time required to complete a globe view is about 35 seconds with a stock Amiga. For the Flat, Mercator, and Globe views the grid lines are spaced 20 degrees in latitude and 30 degrees in longitude. For the Orbital views, above 1,200 kilometers the grid lines are spaced as above, but below 1,200 kilometers they are spaced ten degrees in latitude and 15 degrees in longitude so that they can be more easily seen.

Drawmap is an excellent educational tool, as well as very useful in creating maps for a variety of presentational purposes. It lacks the ability to save the generated maps as IFF files, but any screen-grabbing utility can be used for that function. ■

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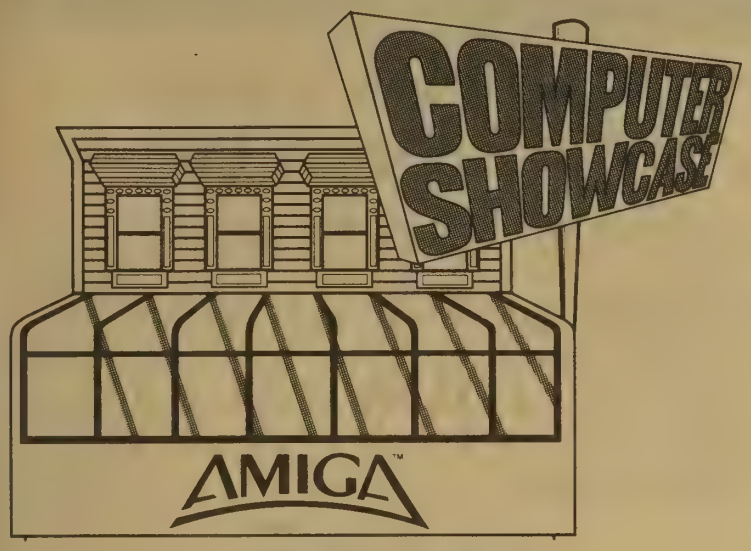

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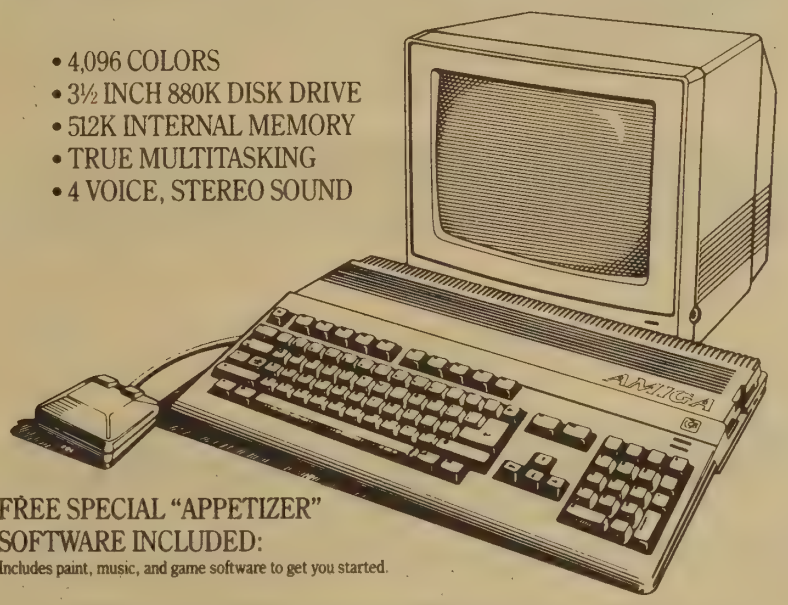

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USER GROUP NETWORK

BY MARY EISENHART

Travels In User Group Land

Happy new year! We hope you all had great holidays and are now embarked on all kinds of interesting adventures with your computers. And that you'll send us lots of news about them...

With the new year, I've been fortunate enough to get out to a user group meeting or two, always a pleasant occasion and definitely a good reality check—the press conference may fool you, but the users don't lie...

A few days ago I went to the meeting of the **Women's Macintosh User Group**, the Mac branch of the **Women's Computer Society**. Members and pressoids were treated to a fascinating presentation by **Donna Dubinsky**, Vice President International at Claris, the company which hosted the meeting. Donna spoke on the challenges of competing in the international marketplace, touching on such issues as the changes in store for Europe in 1992, software piracy and how different countries' legal systems deal with it, localizing your products, and handling distribution and support.

Founder **Rita Zokaei** has lined up some impressive speakers for WCS events: **Dr. Adele Goldberg** of ParcPlace Systems spoke at the inaugural meeting of WCS on January 16, and the second meeting on April 16 will feature **Deborah Brecher** of the Women's Computer Literacy Project. **Susan Gubernat** of *Publish!* will address the **DTP SIG** on February 13, and **Linda Erwin** of Compaq is scheduled for the **PC SIG** meeting on April 16. For information on these and other WCS events, call Rita at (415)344-1334.

Catherine Curtis of San Francisco's **PC Clone User's Group** kindly invited me to address the group on February 12, so that's what I'll be doing, and I hope to meet some of you. As I write this, I have no particular idea what I'm going to be talking about—I've been known to revert to open-ended Q&A in these situations, so bring questions! The meeting is at 7 pm at Fort Mason Center in San Francisco, Room 287 in Building E; for further information, directions, etc., call Catherine at (415)648-8150.

It's sort of a *MicroTimes* doubleheader at the PC Clone group—the following month's meeting on March 12 will feature a presentation by our own **John Dvorak**, so don't miss it! (We don't know whether he'll bring his friends **Hans and Franz**, or **Sparky the Wonder Dog**, but it's a safe bet that whatever he's talking about, it won't be boring...)

Don't forget to check out **BMUG's Mac '90** extravaganza, which would've been last year's Mactoberfest if a slight natural disaster in the Bay Area in October hadn't intervened. The show takes place January 30 and 31 in the Pauley Ballroom on the UC campus in Berkeley. In true BMUG fashion, they're doing demos with a difference: on the 30th, users demonstrate their favorite software. On the 31st, vendors do likewise. There will also be various other presentations, product-related and otherwise. So check it out, and call (415)549-BMUG for further information.

We now have a nice new **MCI Mail** account for your greater convenience in communicating with us. You can reach us there as, surprisingly enough, **MICROTIMES**, and we look forward to hearing from you. If MCI isn't for you, you can send US Mail to User Group Network, 5951 Canning Street, Oakland, CA 94609. Send faxes to (415)652-4618 or (213)467-5486. Email can be sent to **microx** on **The WELL** (415/332-4335), **MICROTIMES** on **MacNET**, or **{pacbell, hplabs, ucbvax, apple}!well!microx** on uucp. Thanks, and see you in February.

Bulletin Boards

209

Bertha Board BBS. (209)823-0093 300/1200/2400/9600, or (209)239-9853, 1200/2400, 8-N-1, 24 hrs. MS-DOS, others. 220 Mb online. Emphasis on programming. Uploads and downloads. No fee. Sysop: Kenneth Roach.

Don's Dental Service. (209)239-4828. 8-N-1, 24 hrs, 1200/2400. On-line dental supply catalogs, No. CA Society schedules, post-graduate course schedules from UCLA, UOP, and Cal. Free. Sysop: Don Carlson.

Night Rider BBS. (209)432-4458, 24 hrs, 1200/2400. Two lines running FX-BBS. MS-DOS 100+ meg. Real-estate and business oriented. Upload and download from a large P/D files section. No fee, no registration required. Sysop: Jim Avey.

Oasis Software Library. (209)823-2803, 300/1200/2400, 8-N-1, 24 hrs. Shareware and PD for IBMs and compatibles. No fee but registration required. Sysop: Tim Campi.

Silicon Realms. (209)754-5530. 300/(1200 Noon) 9:30 am to 6:30 am. Formerly Motherload 64. Commodore, PET & Plus/4. Programmers board, Continuing & Short Story boards, FRPG. Sysop: Joe Commodore.

SMERDON'S CASEL (California Attractions, Sights and Entertainment Listing). (209)521-4910, 8-N-1, 24 hrs., 300/1200/2400. Information on over 700 things to do and see in California. Free. Sysop: Sharon Smerdon.

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The Pathfinder. (209)474-1422, 8-N-1, 24 hrs, 300/1200/2400. Message base, MS-DOS software, 2 chess game areas w/player ranking system. Also lively Trade Ware 1000 campaign. Sysop: David Lanphear.

408

24 Hours-A-Day BBS. (408)448-1126, 24 hrs, 300/1200. 12 step programs. Sysop: Miky Rhymes.

A32 BBS. (408)263-0299. 300/1200/2400. 24 hrs., All Macintosh, Red Ryder Host, email, news and files (40 megs). Mac disk libraries for sale. Sysop: John Griffen. Voice: (408)263-0398.

Amiga Exchange. (408)375-1823. Amiga, Commodore. Runs Opus.

AMME jr. (408)899-1219. Commodore. CBM color/graphics.

APCUG Bulletin Board. (408)439-9367. Sponsored by Borland International, Intel, Tymnet, and Dell Computer and representing 94 PC user groups with 100,000 users. A network to unite computer users around the world.

Apple SMUG. (408)384-0148. Apple.

Beo's Club 21. (408)899-5169. Fun board, all welcome.

Campbell Chapter of 64/More Commodore. (408)946-6154.

Cats, etc. (415)537-2329, 8-N-1, 24 hrs, 1200/2400. A BBS for thinking people.

Clique BBS. (408)625-6580, 8-N-1, 24 hrs, 300/1200/2400. Supporting Amiga & IBM users, on-line games, message bases. Sysop: Jeff Crichton.

Comp-U-Ease. (408)286-8332. 24 hrs. Multi-line, engineering, ACAD, LAN. No games or picture files. Sysops: Stuart Smith and Ed Hwang.

Computer Classifieds. (408)253-4280, 8-N-1, 24 hrs, 300/1200/2400. Select ads by classification or key words. Reply on line to advertiser's electronic mail box. Sysop: J. E. Doll.

Computer Tyme Gap BBS. (408)732-2353. 2400, 24 hrs. 7 days a week. Alpha site for Gap BBS software. Please add ,,,,2 to your dial string. Sysop: Gary Araki.

Consumers Insurance Center. (408)732-4126, 8-N-1, 300/1200. Rate your own auto or homeowners insurance policy! See if your car has been recalled! Buy or sell a car. More! Free! No registration! Sysop: Al Moskal.

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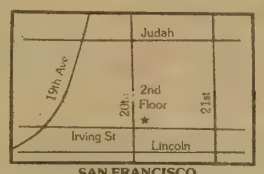

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HD/FD CONTROLLER
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101 KEYBOARD
HERCULES COMP. VIDEO
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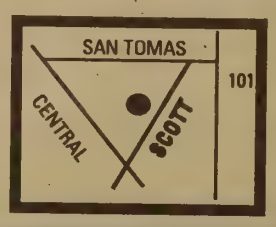

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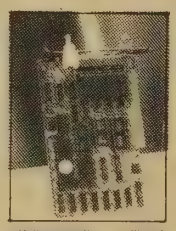

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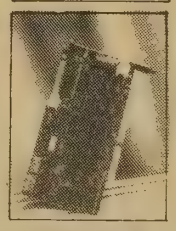

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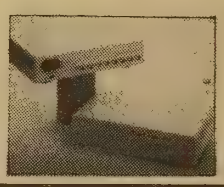

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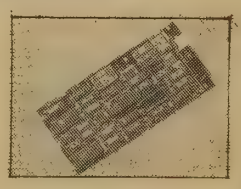

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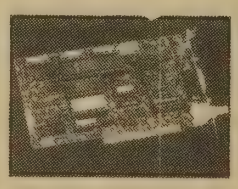

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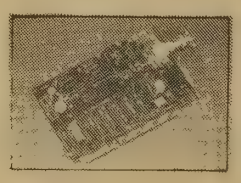

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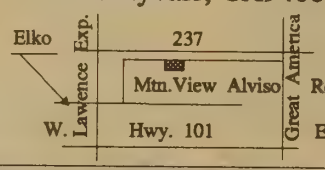

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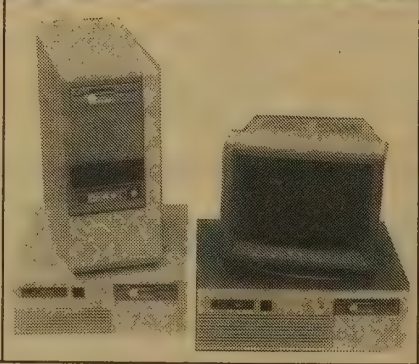

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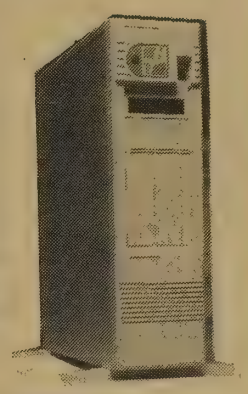

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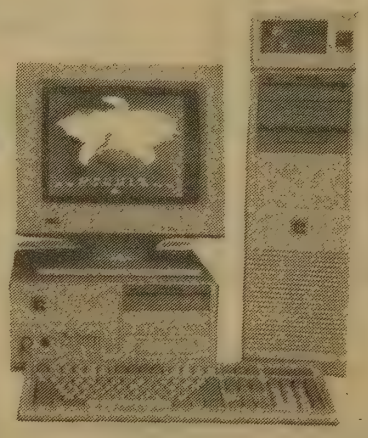

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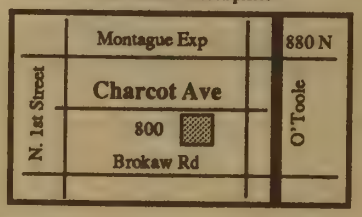

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User Groups

AMIGA

ACCESS (Amiga + Commodore Computer Enthusiasts Society). Meetings: 2nd Thursdays, 7 pm, Livermore Airport terminal off I-580 Airway exit. Call: Paul Tibbals, (415)829-6053.

Amiga Addicts Anonymous. Meetings: Newsletter, public domain library, demonstrations. Write PO Box 4669, Walnut Creek, CA 94596. Call: (415)689-3453.

Amiga East Bay Info Exchange (AEBIE). Meetings: 2nd Tues., 7 to 9 pm, 11185 San Pablo Ave., El Cerrito. Write to P.O. Box 485, Pinole, CA 94564.

ASCITEC: The Amiga Science & Technology Users Group. Meetings: 2nd Thurs., 5-7 pm, Lockheed, B/157, Rm. 4-C, Sunnyvale, CA. Scientific/Video Applications. Classes available.

AUGment - Amiga Users Group of Silicon Valley. Meetings: 2nd Fri., Write to P.O. Box 1863, Fremont, CA 94538 for more info.

AUM—Amiga Users Of Marin. Meetings: Third Wednesdays, 7:30 pm, room 191, Science Center, College of Marin, Kentfield. Call: Bob Galvan, (415)924-5384.

Bay Area Amiga Developers Group (BADGE). Meetings: 3rd Thurs., 8 pm, Turing Auditorium, Stanford University, Stanford, CA. For all Amiga programmers. No membership fee.

CWEST Bay Area Commodore Users Group. Meetings: Third Thursdays, 7:00 pm, Fort Mason, Bldg. C, Rm. 215. Support C-64/128 and Amiga. New Users welcome. Write PO Box 146731, San Francisco, CA 94114-6731.

HAUG (Hayward Amiga Users Group). Meetings: 1st Wednesdays, 7 pm, Mulford Gardens Community Center, San Leandro. Call: Ken, (415)352-0220, or Kenny, (415)351-7349.

Northern California Amiga Club. Meetings: Second Saturdays, 2 pm, Rico's. Supports Amiga. Write: PO Box 54, Bella Vista, CA 96008.

SMAUG (Salinas-Monterey Amiga Users Group). Meetings: 3rd Tues., at 7 pm, Seaside Library, 550 Harcourt Ave., Seaside, CA. Write PO Box 776, Castroville, CA 95012. Call Richard Binsacca at (408) 678-2518.

SVAUG-Scotts Valley Amiga Users Group. Meetings: 2nd Thursday, 7:00 pm, The Computer Room, Kings Village, Scotts Valley.

Vallejo Amiga People (VAMP). Meetings: 2nd Tues., 6:30 pm, Software 1st, Vallejo Corners Shopping Center. Contact Bill Braun at (707) 554-0263.

AMSTRAD

Amstrad Word Processing User Group (AWPUG). We are an exclusive Amstrad PCW Word Processing User Group. Call: Dennis Anderson, (707)795-8548.

North American Amstrad Users Group (NAAUG). National User group. For info send S.A.S.E. to NAAUG, P.O. Box 2178, Ferndale, WA 98240.

APPLE

A.P.P.L.E. Co-op. Meetings: National User Group. Call A.P.P.L.E. Magazine. Write: 290 S.W. 43rd Street, Renton, WA 98055. Or call (206)251-5222 for more info.

Apple Pickers of the Redwood Empire. Meetings: 2nd Sat., 10 am, Santa Rosa JC, Shuhaw Hall, Rm. 1735. Call for sample newsletter. (707)763-8322.

Apple Sac. Meetings: 1st and 2nd Wednesdays, 3rd Tuesdays, 7 pm, Madison School on Harrison St. in Sacramento. Newsletter, demos, swap meets, PD files, BBS.

B.E.A.R. Apple II National Users Group. Meetings: send S.A.S.E. to B.E.A.R., 4719 Meridean Ave. #401, San Jose, 95118. Printshop & Appleworks files, monthly newsletter.

Diablo Valley Apple Users. Meetings: 1st & 3rd Fri., 7 pm, Willow Creek Ctr., 1026 Mohr Lane, Concord, CA. SIG's meet monthly. Featuring library of pub. domain software & club's DOM's. Newsletter, demos, group buys hard/software.

GravenStein Apple IIGS Users Group. Meetings: 3rd Saturdays, 10:00 am, Coddingtown Mall, Santa Rosa. User group to explore new and existing programs and uses for the IIGS, to order equipment and material as a group for quantity discounts and to encourage the use and development of the IIGS among current, new and potential users. Call: Aaron Lamar, president, 938-8479.

San Francisco Apple Core. Meetings: 2nd Tuesdays, 10 am, Daly City Library, 40 Wembley. BBS, SIGS, PD/SW library, Help List, Newsletter, more. Call: 398-2335/771-5830.

San Leandro Apple User Group. Meetings: 1st Thursdays, San Leandro HS, Rm. 213. New owners to experienced users welcome. AppleWorks, software and telecommunications SIGs meet monthly. Call: (415) 483-6046.

Society For The Prevention Of Cruelty To Apples. Meetings: 2nd Wednesdays, 7:30 pm, Fremont Main Library, 39770 Paseo Padre Pkwy. Call: Dean Fern, (415) 537-3439.

Tri Valley Apple II Users Group. Meetings: 1st Thurs., 6:30 pm. Call Esther Farnstrom at (415) 829-3672 or Dan Balsey at (415)828-6237 for meeting location.

ATARI

ABACUS (Atari Bay Area Computer Users Society). Meetings: 1st Saturdays, Christ Lutheran Church, Quintara St. at 20th Ave., SF. Open to all Atari XL/XE and ST users. $20/yr. Call: (415)753-8483.

Bay Area Atari Users Group (BAAUG). Meetings: General meeting and ST users meeting 1st Mon., 7:30 pm, Agnews State Hospital Auditorium at Palm Road & Circle Drive. Off of Lafayette Blvd., Santa Clara. On 2nd Tuesdays. 8-bit users meet at H-P, Wolf and Pruneridge, Cupertino. Call: Joe Fischer, (408)988-3065. BBS: (408)247-1257.

COAST (California Original Atari ST Users Group). Meetings: 3rd Wednesdays, 7 pm, 2105 Bancroft, Berkeley. Call: (415)945-1949.

Diablo Valley Atari Computer Enthusiasts (DACE). Meetings: 1st Thursdays, DACE supports all Atari computers. Newsletter, demos, raffles, DOMs, and programming SIGs. Call: Larry, (415)689-5160.

Sacramento ST Users Group. Meetings: Second Wednesdays, 7 pm, Pac Bell Auditorium, 2700 Watt Ave., Sacramento. Supporting Atari ST and Mega ST computers.(916)944-1291.

San Leandro Computer Club. Meetings: 1st Tuesdays, 8 pm, San Leandro Community Library. Keith Sammons, (415)887-2008.

South County Atari Users Group. Meetings: 2nd Wednesdays, 7 pm, San Jose Computer Store, 640 Blossom Hill Rd., San Jose. Call: Ron Reade, (408)225-7162.

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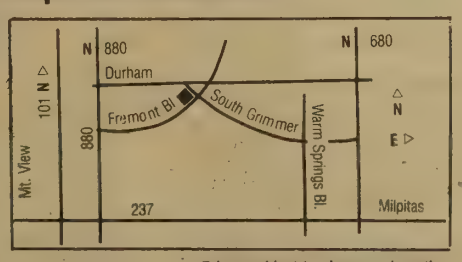

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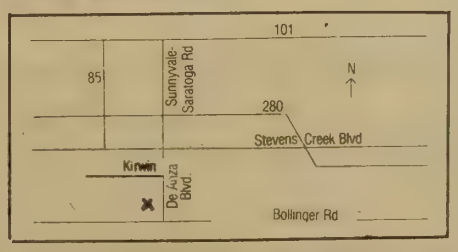

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AT&T Computer Users Group - South Bay. Meetings: Third Wed., 7:00 pm, AT&T Bldg., 1090 E. Duane, Sunnyvale, CA. Call: Joe Lipsig (408)522-4114. BBS: (408) 462-6329.

North Bay AT&T Computer Users Group. Meetings: 1st Wed., 6:30 pm, AT&T building. Call: Joe Mahoney (415)586-8376. BBS: (415)829-6027.

Tri-Valley AT&T Computer Users' Group. Meetings: Third Thursdays, 6:30 pm, 5794 West Las Positas Blvd., Pleasanton. Call: Ed Novi, (415)224-2996, Joe Mahoney, (415)540-2219.

BLIND USERS GROUP

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CAD/CAM

San Francisco Bay Area CAD-DCA User Group. Meetings: 3rd Wednesdays, 6:30 pm. Call: Lupe Chavarria, (415)449-0230.

San Francisco/Marin AutoCAD Users Group. Meetings: 2nd Tuesday evenings. $20 annual membership fee & newsletter. For further info, call Volker, 331-9466.

Sonoma County AutoCAD Users Group. Call (415)777-9144 for info.

TCUG, Textile Computer Users Group. Meetings: Bimonthly, call coordinator for location and time. Thirty-seven members and growing. We use all types of computers to produce textile designs and run textile equipment. Call: Margaret Copeland, (415)284-1635.

COMMODORE

ACCESS (Amiga + Commodore Computer Enthusiasts Society). Meetings: 2nd Thursdays, 7 pm, Livermore Airport terminal off I-580 Airway exit. Call: (415)829-6053.

ACCESS (The Amiga And Commodore Computer Enthusiasts Society). Meetings: 3rd Tues., 7:30 pm, Community Room of Homestead Savings & Loan, 999 E. Stanley Blvd., Livermore, CA. Contact Ron Kremkow at (415)449-1784.

Campbell Chapter of 64/More Commodore UG. Meetings: 4th Tues., BBS (408)946-6154.

Commodore 64 Software Users Group For New Commodore Owners. One-on-one help for new owners. Meeting place & time TBA by members. Call (714)531-2977 for info.

Commodore Connection Users Group. Meetings: 3rd Mondays, 7:30 pm, Homestead Savings. Amigas welcome. Call: John, (415)754-7540.

Cupertino Chapter of 64/More Commodore UG. Meetings: 3rd. Sat., BBS (408)946-6154.

CWEST Bay Area Commodore User Group. Meetings: 3rd Thurs., Fort Mason, Bldg. C, Rm. 215. Supports C-64/128, Amiga. Write P.O. Box 146731, San Francisco, CA 94114-6731.

Diablo Valley CUG. Meetings: 3rd Thurs., 7:30 pm, 1331 Concord Ave, Concord, PO Box 27155, Concord, CA 94527. For info write: PO Box 27155, Concord, CA 94527. Or call (415)932-2413.

F.U.N.H.U.G. - Fremont, Union City, Newark, Hayward User Group. Meetings: 3rd Thurs., 7:30 pm, Newark Public Library, 6300 Civic Terrace Ave., Newark, CA. A user-organized, user-operated user group not affiliated with any computer or software manufacturer or distributor.

Fairfield Commodore User Group. Meetings: 1st & 3rd Mon., Solano County Education Bldg. Write to P.O. Box 2778, Fairfield, CA 94533-9998 for info.

Marin Commodore Users Group. Meetings: 2nd Wednesdays, Redwood High. Call: 883-7748; BBS 883-2558—300/1200.

Mother Lode Commodore Users Group. Meetings: 2nd & 3rd Thursdays, 7:00 pm, Calaveras County Water District Board Room. Supports the Commodore PET, VIC, 64, Plus/4 C-16 & 128. Call: Larry Anderson, 754-5530.

Napa Valley Commodore Computer Club. Meetings: Third Mondays, Rapoport's, 2225 Brown St., Napa. Write to: PO Box 2324, Napa, CA 94558.

North Valley Chapter of 64/More Commodore UG. Meetings: 2nd. Sat., BBS (408)946-6154.

PLUG (The Plus/4 Users Group). No regular meetings. Over 800 members internationally. Write to P.O. Box 1001, Monterey, CA 93942 for info.

San Jose Chapter of 64/More Commodore UG. Meetings: 1st. Sun., BBS (408)946-6154.

Silicon Valley Commodore Club. Meetings: 4th Wed., 7 pm, Hewlett-Packard, 5301 Stevens Creek at Lawrence & 280. C-64, C-128, & Amiga.

COMPUTER ASSOCIATES

Computer Associates Users Group. Meetings: Third Wednesday of the first month of the quarter, 238 Texas St., San Francisco. Come share ideas and information with other local users of Computer Associates Accounting Software. Call: Beth E. Markus, (415)864-6770.

CP/M

San Francisco Computer Society FOG Chapter. Meetings: First Mondays, 7 pm, Laguna Honda School, 1350 7th Ave. CP/M, DOS, Kaypro, Osborne. Call: Ralph Gallagher, (415)929-0252.

DATAEASE

Bay Area DataEase Users Group. Meetings alternate between San Francisco and Palo Alto. Contact Kermit Carter at (415)945-7817 for info.

DBASE

dBASE SIG/SFPCUG. Meetings: 3rd Thursdays, 7:30 pm, 6 N. San Pedro Rd., San Rafael. Call: John Stephenson, (415)488-0342.

dBASE Users Group of Marin & Northbay. Meetings: monthly, call (415)488-0342 for info. Open membership, beginners through developers.

dbDVLPRS.Professional Database Programmers Association. Meetings: 2240 Buchanan, Ste. 5, San Francisco. Database design in micro and micro-to-mainframe environments. Includes dBASE II, III, VI, Clipper, Foxbase, dBXL, Quicksilver, Revelation, C, Pascal, Assembly, etc. Call: Lisa Biow, (415)655-7455.

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Bay Area Desktop Publishing User's Group. Meetings: Thursdays at 2601 College Ave., Berkeley. For more info call Dr. C.J. Wallia at (415)848-8200.

Desktop Publishing SIG/GMUG. Meetings: 1st Tuesdays, 7 pm, San Francisco Business Times Building, 325 Fifth St., San Francisco. Call: 641-GMUG

Desktop Publishing SIG/SFPCUG. Meetings: 4th Tuesdays, 7:30 pm, 179 Parnassus Ave., SF. Call: Phil Smith, (415)566-3648.

First Publisher User Group. Members make up 8 1/2 x 11 formats for newsletters & tip sheets. $35 annual membership. Contact Raul Ibanez, (415)550-0785.

PC Publishers Of Northern California. Meetings: 3rd Thursdays, 6 pm, 10430 Greenview Drive, Oakland. Chapter of Ventura Users Group. Membership $36/year, includes magazine, newsletter, & discounts. Call: Al Magary, (415)661-9270.

San Mateo Ventura Users' Group. Meetings: 2nd Mondays, 7:00-9:30 pm, 619 Bradford, Redwood City. Workshops, lectures, demonstrations of new techniques, shortcuts. Call: Eleanor Church, (415)726-3181, or Pam Sheble, (415)574-2003.

Ventura Desktop Publishing Users Group. Meeting: 1st Tuesday, 7-9:00 pm, 1650 S. Amphlett Blvd., San Mateo. Newly formed group. Call Eleanor Church at (415)726-3181, or Pam Sheble at (415)574-2003 for information.

VPUG (Ventura Publisher User Group). Meetings: 3rd Mon., 6:30 pm, Fort Mason, Bldg. A., Rm. 5, San Francisco, CA.

DYNABYTE

Dynabyte - Tahoe City Dynabyte Users Group. Swap, buy/sell - boards, parts, units. Write to Drawer 2629, Olympic Valley, CA 95730 for info.

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Eagle Computer Users Group. Meetings: 2nd Sat., 9:00-12 noon Tandem Computer, 10435 N. Tantau Ave., Cupertino. Call: (408)972-1965.

EASYTRIEVE

Easytrieve Plus Users Group. Next meeting: June 14, Hyatt, Oakland. Call Debbie at Pansophic, (415)573-7100. All users welcome.

EPSON

Bay Area Epson Salts. Meetings: First Tuesdays, 7:30 pm, 2611 Broadway, Redwood City. Call: Joe, (415)364-0232; or Tom, (415)992-5475.

Epson Users of San Francisco Bay Area. Meetings: 1st Thurs., 7-10 pm, Fort Mason, Bldg. C, Rm. 216, San Francisco, CA. For users of Epson (QX, Equity, PX-8). Presentations, support network, newsletter, public domain software.

EXPERT SYSTEMS

Bay Area Expert Systems In Financial Services. Meetings: 4th Wednesdays, downtown San Francisco. Open to managers, programmers, and analysts in the financial services industry. Call: Blair Hesling, (415)624-3049.

FOXBASE+

FoxBase+ User Group. PO Box 20607, Oakland, CA 94620. New group now forming. Call Rachel Cohen, (415)465-3570.

GAVILAN

Gavilan User Group. Meetings: 2nd Thurs., 7 pm, Lockheed Bldg. 162. Call (408)379-2774 for info.

HEATH

Bay Area Heath User Group (BAHUG). Meetings: 2nd Tuesdays, 7 pm, 2001 Middlefield Rd., Redwood City. Call: Ed Hayes, (415)326-3311.

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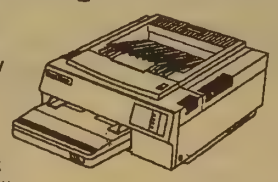

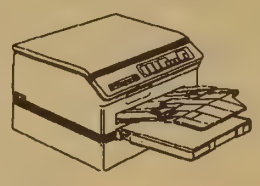

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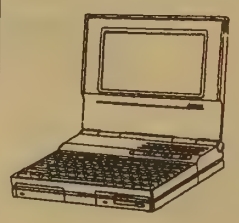

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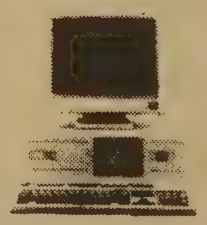

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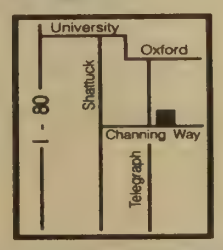

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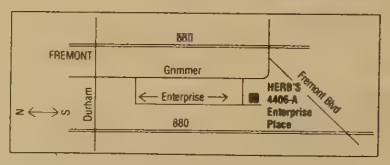

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HyperCard SIG/SEF. Meetings: First Thursdays, 7 pm, Foothill College. David Gewirtz, (415)345-4620, or (415)854-7219.

IBM AND COMPATIBLES

6 User Group. Meetings: 2nd Mondays, 7 pm, Fort Mason Center, Bldg. E, Rm. 287. BBS: (415)621-8425. Call: (415)861-9321.

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Berkeley PC/Compatible User Group. Meetings: 2nd Mondays, 7:00 pm, 2618 Telegraph Ave., Berkeley. No fee, bulletin board, public domain library. Call: Mel, (415)526-4033.

C Language SIG/SFPCUG. Meetings: 2nd Mondays, 6:30 pm, Kam's Restaurant 2068 Center St., Berkeley. Call: Debee Norling, (415)644-1855.

Columbia SIG/SFPCUG. Meetings: 3rd Mondays, 7 pm, Chancellor's Conf. Rm., UCSF, 3333 California St., SF. Call: Dennis Tye, (415)566-0587.

CUE Club. MS-DOS machines. SIGs for other computers. BBS: (209)239-9853. For more info call (209)858-4401.

DataPerfect SIG/SFPCUG. Meetings: 2nd Mondays, 7 pm, Kam's Restaurant, 2068 Center St., Berkeley. Call: Christy Quinn (415)644-1855.

dBASE SIG/SFPCUG. Meetings: 3rd Thursdays, 7:30 pm, 6 No. San Pedro Rd., San Rafael. Call: John Stephenson, (415)488-0342.

Desktop Publishing SIG/SFPCUG. Meetings: 4th Tuesdays, 7:30 pm, 179 Parnassus Ave., SF. Call: Phil Smith, (415)566-3648.

Diablo Valley PC Users Group. Meetings: Walnut Creek, CA. Write: P.O. Box 8040, #117, Walnut Creek, CA 94596.

East Bay Fog. Meetings: Monthly meetings, Apostleship of the Sea, 600 Terminal St., Oakland. Newsletter, BBS. Call (415)272-9099 for more info.

Enable SIG/SFPCUG. Meetings: 2nd Wednesdays, 7:30 pm, Walnut Creek. Call: Sandi Baker, (415)946-1716.

FUNHUG—PC. Meetings: 3rd Wednesdays, 7:30 pm, Fremont Library, 39770 Paseo Padre Parkway, Fremont, in the Meeting Room. Mainly just the MS and PC DOS world. Send SASE to Russ Fischer, 2792 Arlington Place, Fremont 94555.

IBM & Compatibles Users Group (ICUG). Meetings: A mail-based user group with possible meetings. Not for PCjrs. $8/yr. Write: Dan Tuma, 30 Arjang Ct., Alamo, CA 94507-2041.

IBM Compatible Users Group. Meetings: monthly, call (415)969-6916 for info 7-10 pm.

IBM PC Users' Group Of The Redwoods (PCUGR). Meetings: 2nd Thursdays, 7 pm, Santa Rosa Vets Memorial, East Dining Rm. Newsletter, BBS, public domain & shareware disk library, $25/yr. Call: (707)527-USER.

IBM Technical SIG/SEF. Teknowledge. Call for dates and time. Call: Mike Schmit, (408)244-6826. or (415)854-7219.

Kay+Fun Peninsula Computer Club. Meetings: 2nd Thursdays, 7:30 pm. Social Room, 222 Laurel St., San Carlos. CP/M + DOS library. BBS: (415)572-8219. Call: 593-9981.

Lotus SIG/SFPCUG. Meetings: 3rd Mondays, 7 pm, Chancellor's Conf. Rm., UCSF, 3333 California St., SF. Call: Jerry Stern, (415)282-4100.

Marin-Sonoma PC Users Group (MSPCUG). Meetings: Last Tuesdays, Guzman Hall, Dominican College, Grand Avenue., San Rafael. Call: (415)491-HAWK.

Mid-Peninsula IBM-Club. For IBM employees only. Call Scott Maiden for info: (415)855-4509.

Modula-2 SIG/SFPCUG. Meetings: 3rd Thursdays, 7:30 pm, Call: Richard Lesnick, (415)398-3587.

MS Word SIG/SFPCUG, 3rd Mondays, 6:30 pm, Chancellor's Conference Room, UCSF, 3333 California St., SF. Vic Saravia (415)929-1993.

NewViews SIG/SFPCUG. Meetings: 4th Mondays, 7 pm, 179 Parnassus Ave., SF. Call: G. Watson, (415)398-3587.

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PC Clubhouse. Meetings: 1st Fridays, 8 pm, Cal State Hayward, Rm. 2078, Heiklejohn Hall. 2000 disk public library, expert help, software/hardware demos, $24/yr. Call: (415)538-2449 or 846-3575.

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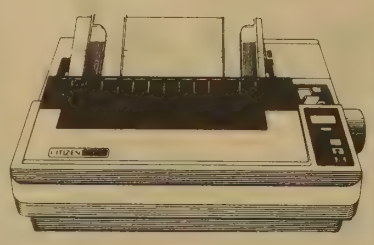

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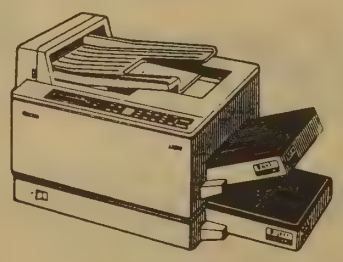

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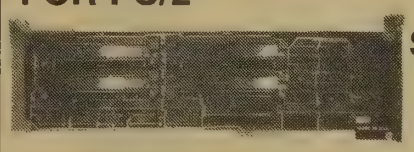

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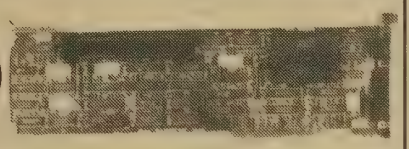

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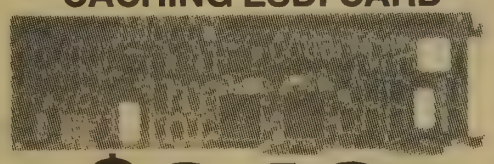

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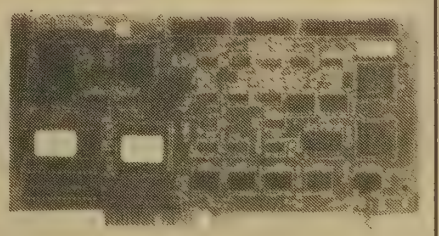

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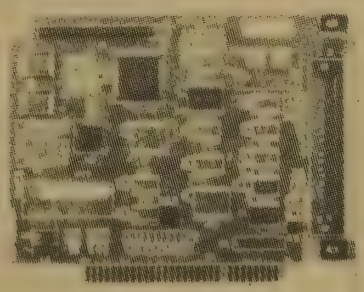

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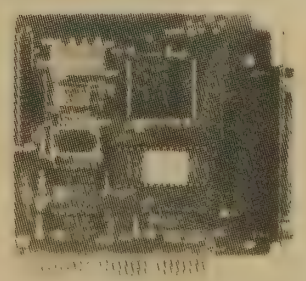

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San Francisco Computer Society. Meetings: 1st Mon., 7:00 pm. Laguna Honda School Conference Room (first Floor), 1350 7th Avenue, San Francisco. MS-DOS machines, Osborne, Kaypro, Morrow. Call: Ralph Gallagher, 929-0252.

San Francisco PC Users Group. Meetings: 3rd Mondays, 7:30 pm, Auditorium, UCSF, Laurel Heights, 3333 California St., SF. Call: (415)221-9166. BBS: (415)621-2609.

San Francisco PCjr Users Group (SFPCjrUG). Meetings: First Sundays, 7:30 pm, Rm. C205, Fort Mason Center, San Francisco. Demonstrations and discussions, club library, disks for sale. Call: John King, 472-7035.

Santa Cruz Computer Society. Meetings: 3rd Thursdays. 7 pm, Santa Cruz County Office of Education, 809 Bay Avenue, Suite H, Capitola. Call: 479-1180.

Silicon Valley Computer Society. Meetings: 4th Wed., 7:30 pm, Oak Room, at Hewlett Packard, on Pruneridge in Cupertino. Call Kent Stafford for info at (408)286-2969.

Silicon Valley FOG. Meetings: 3rd. Wed., 7:30 pm, Saratoga Community Library, 13650 Saratoga Ave.

Solano Community PC Users Group. Meetings: 3rd Monday, 7 pm, Fairfield High School.

Solomon User Group Of Silicon Valley. Meetings: Wednesday, August 10, 6:30 pm, Conveyor And Storage Dynamics, 2581 Leghorn St., Mt. View. Call Grihalva Associates, 39899 Balentine Dr., Suite 175, Newark, CA 94560; (415)659-1515.

South Bay AT&T PC UG. Meetings: Call for info. Call: (408)226-0116.

South Bay WordPerfect User Group. Meetings: Monthly, 13650 Saratoga Ave., Saratoga. Call: Martin Van Derpool, (408)238-8434.

South County PC Users Group. Meetings: Round Table Pizza Restaurant, 22457 Foothill Blvd., Hayward. Call: R.A. McCloud, (415)537-9899.

Teachers SIG/SFPCUG. Meetings: 3rd Mondays, 7:30 pm, Chancellor's Conf. Rm., UCSF, 3333 California St., SF. Call: Margaret Gwathmey, (415)982-4221.

TRS Nybblers. Meetings: 2nd Friday, 8 pm, Chabot College, 2555 Hesperian Blvd., Rm. 600, Hayward. MS/DOS, CP/M, laptops, CoCo's, Mod 1, 3, 4; Mod 2, 12, 16, 6000. PD software education modules, problem-solving committee.

Valley Computer Club IBM PC Users Group. Meetings: 3rd Wed., 6 pm, Xerox Bldg. 475 Oakmead Pky, Sunnyvale, CA. $24/yr member. Monthly VPUG News, access rights to VPUG-SIG Advice on desktop pub. techniques, new products, bugs, etc.

WordPerfect SIG/SFPCUG. Meetings: 3rd Mondays, 7 pm, Chancellor's Conf. Rm., UCSF, 3333 California St., SF. Call: Debbie Foster, (415)285-4534.

INMAGIC

San Francisco INMAGIC User Group. INMAGIC Meetings: Monthly. Call for dates and times. Call: Dana C. Ellingen, 423-4582.

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BAKUP. Meetings: 3rd Tuesdays, 7:30 pm, Albany Senior Center, 846 Masonic Ave., Albany. Call: Bob Athey, (415)526-3541.

Kay+Fun Peninsula Computer Club. Meetings: 7:30 pm, Social Room, 222 Laurel St., San Carlos. CP/M + DOS library. BBS: (415)572-8219. Call: 593-9981.

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San Francisco Computer Society. Meetings: 1st Monday, 7:00 pm, Homestead S&L, 5757 Geary Blvd., San Francisco CP\M and DOS machines. No BBS. Call: Ralph Gallagher, (415)929-0252 for information.

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Bay HPX, Laptops, and Handhelds. Meetings: 2nd Saturdays. Call: Jim Horn, (707)794-3130 or Michael Felsenstein, (415)564-8279.

MACINTOSH

A32, The Association Of Apple 32 Users. Meetings: 2nd Saturdays, GTE cafeteria, Mountain View. Membership includes monthly meetings, access to Disk of the Month, full BBS privileges, the ICON newsletter, SIGs, discounts, and much more. Call: 263-0398.

APX, Inc. Macintosh. A national intercorporate computer users information service with several communications channels including an electronic forum on MacNet, newsletters, and local and national meetings and special panels. Several local chapters exist, you can start one too. Call: (408)745-0665, or write to: Mike Bailey, APX, 370 Altair, PO Box 175, Sunnyvale, CA 94086.

Bay Area MacForum. Meetings: 3rd Saturdays, noon, Daly City Library, 40 Wembeley. BBS, SIGS, PD/SW library, Help List, Newsletter, Newcomers Meeting, more. Call: (415)771-5830/398-2335.

Berkeley Macintosh User Group (BMUG). Meetings: every Thurs., 6 pm, Physical Sciences Lecture Hall, UC Berkeley Campus. SIG meetings on Mondays, Tuesdays & Wednesdays. Call for this week's topic. (415) 849-9114. BMUG, 1442A Walnut St., #62, Berkeley, CA 94709.

Christian Macintosh User Group, San Francisco Chapter. Meetings: 2nd Thurs., San Francisco. Newsletter and support available. Contact Rick Thrasher at (408)437-1913. Bible Study and DTP SIGS.

Christian Macintosh User Group, Silicon Valley Chapter. Meetings: 1st Thurs., San Jose. Newsletter and support available. Contact Rick Thrasher at (408)437-1913.

Desktop Publishing SIG/GMUG. Meetings: 1st Tuesdays, 7 pm, San Francisco Business Times Building, 325 Fifth St., San Francisco. Call: 641-GMUG.

Diablo Valley Apple Users. Meetings: 1st & 3rd Fri., 7 pm, Willow Creek Ctr., 1026 Mohr Lane, Concord, CA. SIG's meet monthly. Featuring library of pub. domain software & club's DOM's. Newsletter, demos, group buys hard/software.

EBMUG (East Bay Macintosh Users Group). Meetings: 3rd Tuesdays, 7:30 pm, 724 Allston Way (@ 4th) near University Ave., Berkeley. Members receive free PD software. Bring blank disk. Meetings open to everyone. Call: Terry Pennington, (415)486-0147.

GMUG (San Francisco's Macintosh User Group for Gays and Lesbians). Meetings: 3rd Wednesdays, 7:30 pm. Call: 641-GMUG.

HyperCard SIG/GMUG. Meetings: 7 pm, 78-A Mars St., San Francisco. Call: 641-GMUG.

Mac Diablo Users Group (MDUG). Meetings: 3rd Tues., Community Room, Glendale Federal Savings, 3101 Crow Canyon Road, San Ramon.

MacCruisers—Santa Cruz. Meetings: 2nd Wed., Jade Street Community Ctr. at 45th Ave., Capitola, CA.

Macintosh SIG/SEF. Meetings: 7 pm, 2nd Tuesdays, Apple Cafeteria. Call for dates and time. Tony Meadow, (415)644-9400.

Macintosh Users Of ComputerWare (MUCoW). Meetings: 2nd & 4th Wednesdays, 7:00 pm, Above ComputerWare store, 490 California Ave., Palo Alto. Call: (415)496-1051 or 496-1033.

MacNexus—Sacramento's Macintosh Users Group. Annual dues, $30, includes monthly newsletter. Contact: MacNexus, PO Box 163058, Sacramento, CA 95816; (916)448-6481.

Macs Of Marin (MOM). Meetings: 2nd Thursdays, 7 pm, Redwood High School, 395 Doherty, Larkspur. Call: Steve Salzman, 459-5707.

Silicon Valley Computer Society's Macintosh SIG. First meeting: September 21, 7:30 pm, 6th floor offices of Arthur Young and Co., Mitsubishi/Plaza Bank Building, 55 Almaden Blvd., San Jose. A forum for shared ideas. First meeting will be a demonstration of HyperCard. Other demos are planned for future meetings. Call: Dennis Dawson, (408)947-5550.

Stanford Macintosh Users' Group (SMUG). Stanford community membership: $25; public membership: $35 per year. Call: 723-SMUG. BBS: (415) 723-7685.

TI-West. Meetings: 2nd Fri., 8 pm, Chabot College, Rm. 600, 25555 Hesperian Blvd., Hayward, CA. Access to a variety of pub. domain software, education modules "problem solving" peripheral committee.

Tri-Valley Macintosh User's Group (TMUG). Meetings: 1st Thursdays, 7 pm, 4695 Chabot Dr., Rm 114, Hacienda Business Park, Pleasanton. Newsletter, large P/D library. Call: James, (415)426-8756 eves, Mike, (415)838-6165.

MICROSOFT

Mac Diablo Users Group (MDUG). Meetings: 3rd Tuesday, 7:30 pm, Community Room, Glendale Federal Savings, 3101 E. Crow Canyon Rd., San Ramon. Small, helpful group.

Microsoft Word Users Group. Meetings: 4th Mondays, 7:30 pm-9:30 pm, Hewlett-Packard Cupertino, Oak Room Bldg., 48 Pruneridge, 100 yds. east of Wolfe off Hwy 280. August 22: Chris Donner, Pres. Access Softek on DRAGNET for Text Retrieval and Management. Call: Bill West, (408)356-8805.

Mirosoft Word SIG of the SVCS. Contact Bill West, (408)356-8805.

MINDSET

San Francisco Mindset Users Group. Call: (408)270-0251.

MORROW

BAMDUA (Bay Area Micro Decision Users Assoc.). Meetings: 3rd Tues., 7:30 pm, Albany Senior Center, 846 Masonic Street (just north of Solano) in Albany, CA. Voice: (415) 534-4257. BBS: (415) 654-3882. P.O. Box 5152 Berkeley, CA 94705.

San Francisco Computer Society. Meetings: 1st Mon., 7:00 pm. Homestead S&L, 5757 Geary Blvd., San Francisco. MS-DOS machines, Osborne, Kaypro, Morrow. Call: Ralph Gallagher, 929-0252.

NEC

Bay Area NEC/100 Users Group. Meetings: 2nd and 4th Wednesdays.

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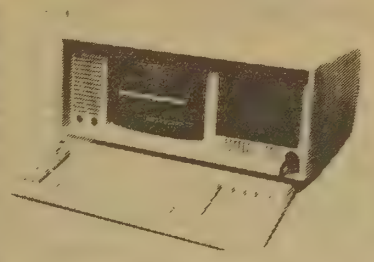

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NOVELL

Novell Users Group. Meetings: Third Wednesdays, 6:30 pm, Coco's restaurant, 1305 South Mary, Sunnyvale. Newsletter, bulletin board, product demos, assistance for beginners. Call: Bill Strouse, (408)453-3321 days; modem, 24 hrs: (408)453-3326.

ORACLE

Northern California Oracle User Group. Meetings: One meeting every 3 months in Bay Area. Call: Merrlee Nohr, (415)463-2040.

Northern California Oracle UG. Meetings: Call (408)738-8330 for info. Meets every 3 months at different Bay Area locations. Newsletter published between meetings.

OSBORNE

San Francisco Computer Society. Meetings: 1st Monday, 7:00 pm, Homestead S&L, 5757 Geary Blvd., San Francisco. CP\M and DOS machines. No BBS. Call: Ralph Gallagher, (415)929-0252 for information.

PARADOX

Silicon Valley Paradox Users Group. Meetings: 3rd Tuesdays, except December. For information, call: Emily Alford, (408)285-0348, or LaTulipe at (408)646-0297.

PROGRAMMING LANGUAGES

APL Bay Area Users' Group. Meetings: 2nd Monday, 6:30 pm, I.P. Associates, 425 Sherman Ave., Suite 200, Palo Alto.

Bay Area Users Of Progress Software. Meetings: 3rd Wednesdays, 7:30 pm. 100-member group discusses and shares Progress programming tips and techniques. Call: John Campell, (415)857-0686.

C Language SIG/SFPCUG. Meetings: 2nd Mondays, 6:30 pm, Kam's Restaurant 2068 Center St., Berkeley. Call: Debee Norling, (415)644-1855.

CC County Programmers Group. For info write: 3115 Elizabeth Lane, Antioch, CA 94509.

Forth Interest Group of Silicon Valley. Meetings: 4th Sat., 1 pm, Oak Room, at Hewlett-Packard, on Pruneridge in Cupertino. Call George Shaw at (415)276-5953 for info.

Forth Interest Group, North Bay Chapter. Meetings: 2nd Sat., 1 to 5 pm, South Berkeley Community Library, corner of Russell and Martin Luther King Junior Way. One block north of Ashby BART station. Contact George Shaw, (415)276-5953.

Modula-2 SIG/SFPCUG. Meetings: 3rd Thursdays, 7:30 pm. Call: Richard Lesnick, (415)398-3587.

PIE (Programming and Interfacing Enthusiasts). Five SIGS for Mac, Apple II, and PC. PIE BBS open to member and non-members. Call: Duane B. McGhie, (408)252-4944.

Prolog Forum. Meetings: Monthly, 2nd Thursday 7:00 pm, Belmont and various locations. Prolog Forum is a group dedicated to supporting users of the Prolog computer language in artificial intelligence. Call Mark A. Epperson at (415)594-9981.

SEF OOP SIG. Meeting: Third Tues., 7 pm, Parc Place Systems, 2400 Geng Rd., Palo Alto. Call: Dean Ritz, (415)691-6727 or (415)854-7219.

R:BASE

East Bay User Group. Meetings: Last Thursday of each month. For location and time, call: Scott, 451-5316. endro Computer Club.

R:BASE User Group Of The Redwoods. Meetings: Third Wednesdays, 3 pm, Sonoma/Marin County rotating meeting places. Call: Jim Ray, (707)886-5315.

Northern California User Group. Meetings: Every 3 months. For schedule, call: Ken Lebeiko, 881-2652.

Peninsula User Group. Meetings: First Wednesdays. For location and time, call: Don Whitecar, 592-5033.

TANDY/RADIO SHACK

CoCoByte. Meetings: Last Saturdays, 2 pm-4 pm. Supporting the Tandy Color Computer 11, 2 or 3 with Spanish, English & French software. Write to: CoCoByte, c/o Fabian Rodriguez, A.A. 5976, Cali-COLOMBIA.

Model 100, 102 & 200 Support. Meetings: Int'l support by mail, voice & BBS. Free on-line weekly news letter. Write Club 100 984 Hawthorne Dr., Walnut Creek, CA 94596. Or call, (415)937-5039.

Tandy 1000 (The Mug). Mail-based user group w/ monthly newsletter. Not for PC jrs. Members communicate through newsletter. $8/yr. fee; checks to: Daniel Tuma, 30 Arjang Ct., Alamo, CA 94507-2041.

TRS Nybblers. Meetings: 2nd Fri., 8 pm, Chabot College, 25555 Hesperian Blvd., Hayward. MS-DOS, CP/M, laptops, Mod 1, 3, 4, Mod 2, 12, 16, 6000. Bud Gallagher (415)522-5960 or Bruce Jarvis, (415)846-3575.

REVELATION

Bay Area Revelation UG. Meetings: 1st Tues. Call: (415)759-1210.

ROBOTICS

Home Robots Now! Meetings: 2nd Thursdays. A two-year-old user group currently working on an autonomous robot for navigating in a house. Call: James P. Cruse, (408)475-7444.

SF Robotics Society. Meetings: 2nd

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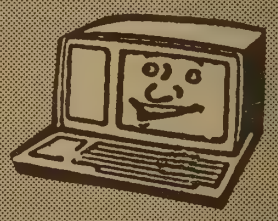

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SOLOMON

San Francisco Solomon III Users Group. Meetings: last Wed., odd months 6-9 pm, Price Waterhouse, 555 California St. 36th fl., San Francisco. Annual membership - $50; corp. membership - $75.

Solomon User Group of Silicon Valley. Meetings: For info contact Grihalva Associates, 39899 Balentine Dr., Suite 175, Newark, CA 94560.

SQL

SQL_BAYS, The Bay Area SQLBase User Group. Meetings: First Thursdays, 6–9 pm, 394 Pacific Ave., Lower Level, San Francisco. Review client/server computing with Gupta Technologies SQLBase database server. Fresh topic/speaker/demo. Call: Todd Ziesing or Ric Galgliardi, (415)731-2201.

SUN

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S—100

S—100 Business Users Group. Meetings: 4th Tues., 7:30 pm, Santa Clara Univ., Rm. 101, Bannan Engineering Bldg. CP/M & MS-DOS libraries. BBS: (408)262-5150, 8-N-1, 2400/1200/300.

TEXAS INSTRUMENTS

Bay Cities User Group. Meetings: 1st, 3rd, 5th Wednesdays, 7:30 pm, 1637 Morgan, Mt. View. Call: Jack, (415)964-4344.

Brea 99'ers Users Group. Meetings: 1st Mon., 7:30 pm, Mercury Savings, La Habra, CA.

San Francisco 99ers. Meetings: 3rd Saturdays, 3751 Elston Ave. Call: Fred, (415)530-8335.

SCV TIPC Users Group. Meetings: 4th Thursdays, Magnolia Inn, 176 S. Bernardo, Sunnyvale. Newsletter, BBS, software library, group continues to grow. Call: Thor Firing, (415)386-5237.

Thousand Oaks Personal Computer Club (TOPCC). Meetings: monthly. Call: (714)686-0336.

TIMEX/SINCLAIR

Timex Sinclair East Bay Z80 Users Group (TSEBZUG). Russ English, (415)465-3116.

Timex Sinclair Peninsula Users Group (TSPUG). Contact George Mockridge, (408)878-1773.

Timex/Sinclair Users of Silicon Valley (GUTS/SV). Meetings: each Sat., 9 am, Stanford Univ., Jordan Hall (quadrangle), Math Bldg. RM 380C. SW library & newsletter. For topic check PDSE BBS in Sunnyvale (408)735-7390, 300/1200, 8-N-1, 24 hrs.

UNIFY

Unify Users Group. Information exchange, presentations and problem-solving related to Unify products. Email distribution is available for those connected to USENTE or UUCP mail at UUg-dist@mrspoc. Call: Steven List, 961-6112.

UNIX

SVNet. UNIX User Group. UNIX Meetings: 3rd Tuesdays, 10500 DeAnza, Cupertino. Talks on UNIX topics, books, and reviews. Call: Ralph Barker, (408)248-8649.

VENTURA PUBLISHER

San Mateo Ventura Users' Group. Meetings: 2nd Mondays, 7:00-9:30 pm, 619 Bradford, Redwood City. Workshops, lectures, demonstrations of new techniques, shortcuts. Call: Eleanor Church, (415)726-3181.

Ventura Desktop Publishing Users Group. Meeting: 1st Tuesday, 7-9:00 pm, 1650 S. Amphlett Blvd., San Mateo. Newly formed group. Call Eleanor Church at (415)726-3181, or Pam Sheble at (415)574-2003 for information.

Ventura Publisher User Group (VPUG, Inc.). Meetings: 3rd Wednesdays, 6–9 pm, Hewlett-Packard, Oak Room, Wolfe Road at Pruneridge, Cupertino. Workshop, Q&A, HW/SW demonstrations. Monthly 70-page mag, BBS, discounts, etc. $36/yr. Call: (408)227-5030.

VPUG (Ventura Publisher User Group) Meetings: 3rd Mon., 6:30 pm, Fort Mason, Bldg. A., Rm. 5, San Francisco, CA.

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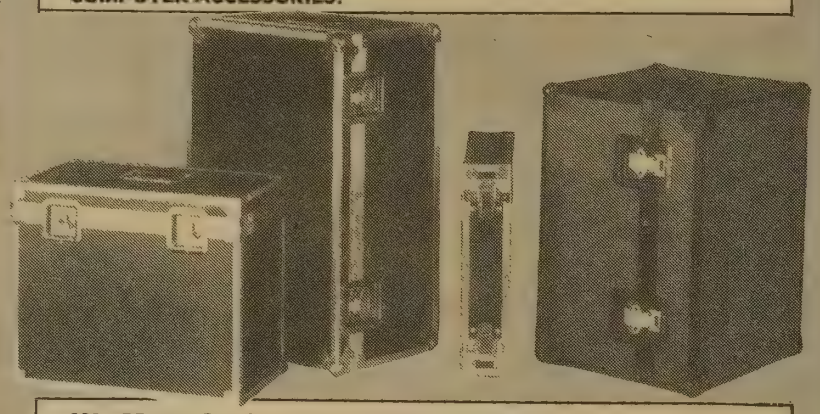

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Artificial Intelligence Special Interest Group. Meetings: 2nd Thurs. Engineering 101, Santa Clara University. Independent nationally recognized group studying and developing AI and artificial neural networks. Call Kent Byron (408)244-8739 for info.

Association for Women in Computing. Meetings: 1st Wednesday of each month, 6:30 pm, Stagecoach Restaurant, 44 Montgomery St., San Francisco. Call 655-3110 for information.

BAY HPX. Meetings: 2nd Saturday Laptop & handhelds. Call Jim Horn or Michael Felsenstein: (707)794-3130/ (415)564-8279.

Bay Area CYMA Dealers Association. Meetings: 2nd Tuesdays, Thursdays; 4:30-6:30 pm, San Mateo. Networking and support for McGraw-Hill accounting software consultants and retailers. Call: (415)345-5955.

Baytalk Computer Users Group. Write: PO 369, Berkeley 94701. BBS: (415)864-6430, 300/1200, 8-N-1.

Business Computerization User Group. Group forming. Write 6938 Buckingham Blvd., Berkeley, CA 94705, or call (415)848-2080.

California Genealogical Society Computer Interest Group. Meetings: 2nd Sat.-odd months, Genealogical Society Library, San Francisco.

Computer Associates Users Group. Meetings: 3rd Wednesdays, 6:30 pm, 1500 Van Ness Ave. Call: Beth Markus, (415)864-6770.

Computers & Law Assoc. Meetings: McGeorge School of Law, 3200 Fifth Ave., Sacramento, CA 95817.

Contra Costa Computer Club. Meetings: 2nd Tuesdays, 7:30 pm, Willow Creek Center, 1024 Mohr Lane, Concord. Call: Jim Leonard, (415)685-6178, or Roy Copeland, (415)676-6268.

CYMA/McGraw-Hill Users Group Meeting. Meetings: Monday, October 24, 3:00-5:00 pm, McGraw-Hill Publications Building, 425 Battery St., San Francisco. Meet CYMA professionals and learn how to get the most from your software. Call: (415)839-7466.

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DPMA–San Francisco. Meetings: Third Tuesdays, 341 Sutter St., upstairs. Call: (415)442-6200, ext. 500.

East Bay Fog. Meetings: 2nd Wednesdays, Port of Oakland, 7th & Terminal. Call: Jean Koch, (415)272-9099.

East Bay User Group. Meetings: 3rd Wednesdays, 7 pm, 12500 Campus Dr., Oakland, Rm R-7, Call: (415)436-2453.

Entrepreneurial Support Group. CEO. Meetings: SASE, P.O. Box 2781, San Rafael, CA.

Ham Radio Computer Packet Group. Meetings: 2nd Fridays, 8 pm, Salvation Army, 4600 Appian Way, El Sobrante. Learn how to use your computer to broadcast all over the world with the fascinating world of Ham Radio. Call: Bob Fields, (415)237-3761.

High Tech Gays. Meetings: 2nd Sundays, Part of the National Gay & Lesbian Task Force. Call: (408)993-3830.

High Technology Entrepreneurial Council. Meetings: Wednesdays, 6:30 pm, Piedmont Community Center, 711 Highland Ave., Piedmont. HTEC is a nonprofit corporation dedicated to providing software developers and other high tech entrepreneurs a forum for developing marketing strategies, building business relationships and exchanging experience and information. Call: Rachel Munoz, (415)339-3895.

Independent Computer Consultants Assn., Northern California Chapter. Meetings: Third Wednesdays, 6–9:00 pm, San Francisco Airport Hilton. Call: ICCA, (415)441-2948.

Independent Computer Consultants Association (ICCA). A national professional association dedicated to ethical standards in computer consulting. Provides a computer consultant referral service. Meets monthly. Call: (415)441-2948.

Microcomputer Users of Santa Cruz Fog Affiliate #116. Meetings: 2nd Thursdays, Green Acres School, 966 Bostwick Lane, Santa Cruz. This facility is wheelchair accessible. Call: Barney, (408)476-0504.

MORE: Modemusers Of The Redwood Empire. Meetings: Thurs. July 14; Fri. Aug. 9; 7 pm, Roundtable Pizza, Highway 12 @ Stony Pt. Free membership for modemers who want to get together and talk about local boards. Includes novices to techno-wizards. Call (707)546-5203.

Mt. Diablo Technology Association. First meeting: Wednesday, Sept. 14. Others monthly at Michael's Restaurant in Walnut Creek. Lunch and evening meetings, send for calendar. Back by popular demand. Will explore common concerns in industry and

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North Bay Users Group (NBUG). Meetings: 2nd Thurs. 7:30-10 pm, 201 Maine St., Vallejo, CA. Family Computer Club dedicated to all forms of computing. Determine market opportunities, group research projects. (415)564-6669.

Northern California User Group. Meetings: Every 3 months. For schedule, Call: Ken Lebeiko, 881-2652.

Nota Bene User Group. Meetings: 3rd Tues. or Thurs., 7:30 pm Berkeley or Peninsula. For location and date, call: Thomas Ross, (415)845-2410.

PASS: Professional Association of Secretarial Services. Meetings: 2nd Saturdays 11:30 am, Oakland or San Mateo. Call: Nina Feldman, (415)655-4296.

Pioneer AWSSM (Association For Worldwide Software Support Managers). Meetings: 2nd Tuesdays, 6 pm. Call: Janice Corbo, 3Com Corp., (415)694-2841.

Pracsa, for Sysops & Users. Meetings: 2nd Wednesdays, 6:30 pm, Coco's Restaurant, 1305 South Mary, Sunnyvale. Call: Bill Strouse, (408)453-3321.

ProTel (Professionals In Telecommunications). Meetings: Monthly. Holiday Inn, 1221 Chess Drive, Foster City. ProTel is a network organization for people interested in telecommunications. Leave a message at (415)227-5637 for information.

San Jose User Group. Meetings: First Wednesdays. For location and time, call: Hanna Varniz, (408)984-8484.

SEF Marketing SIG. Meetings: 4th Thursdays, Teknowledge, 1850 Embarcadero, Palo Alto. Call: Don Morrison, (408)425-7222, or (415)854-7219.

Silicon Valley Computer Society. Contact Kent Stafford (408)286-2969. Or write to 2464 El Camino Real #190, Santa Clara, CA 95051.

Society For Technical Communication, Berkeley Chapter. Meetings: 2nd Wednesdays. International association of technical writers, editors, illustrators, and instructional designers. Call: Rae Montor, (415)531-2315.

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Software Entrepreneur's Forum (SEF). Meetings: 3rd Thurs. 1875 Embarcadero Rd., Palo Alto. Helps individual software developers and startup software companies. Call for complimentary newsletter. (415)854-7219.

South Orange County Computer Club. Meetings: 3rd Thursdays, 7:30 pm, Westminster Community Ctr., Westminster Blvd. east of Beach. Friendly discussion, presentations on using computers, public domain software libraries. All computer types.

Technology Executive Roundtable (TER). Meetings: Fourth Tuesdays, 6:00 pm, Santa Clara.Call: Jenny Hoyt, (408)997-1826.

The Hispanic Computing Association. Meetings: 3rd Thursdays, DataDesigns/American Music, 2388 Mission St., SF. Spanish/English Computer Information, PC & Mac presentations and solutions. Call: Juan Lira, (415)824-8337.

United Sysops Association (USA). Meetings: 2nd Wednesdays, Coco's Restaurant, 1305 S. Mary Avenue, Sunnyvale. The emphasis of the group is to help the sysops around the world, and especially in the countries of the Pacific Rim. Call: William Strouse, (408)453-3321.

Valley of the Moon Users Group. Meetings: 2nd Saturdays monthly, 10:00 am, Moose Lodge, Sonoma. All systems welcome. BBS, 300 Baud, 24 hours, (707)996-7922.

Women's Computer Society. New organization to increase the computer literacy of women of all ages. WCS will represent a number of SIGs, including the already established Women's Macintosh User Group (Women's-MUG). Call: Rita Zokaei or Judy Onton, (415) 574-8225/(408)867-2842.

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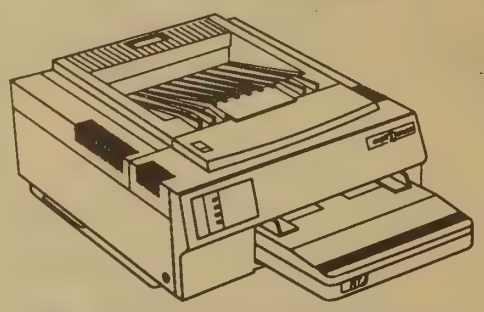

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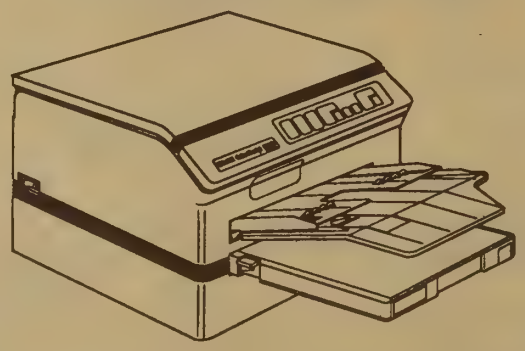

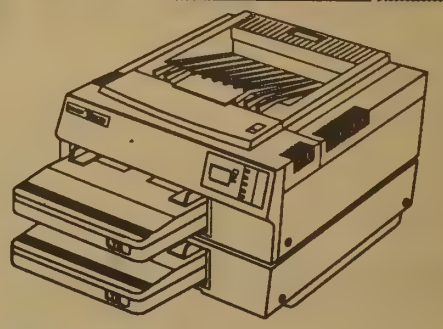

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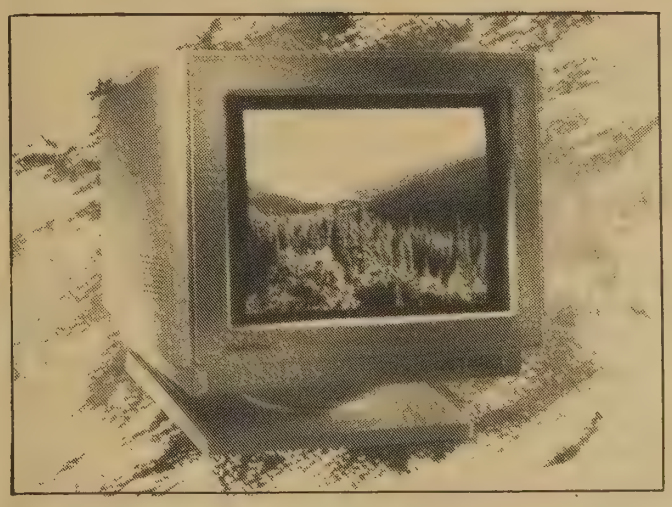

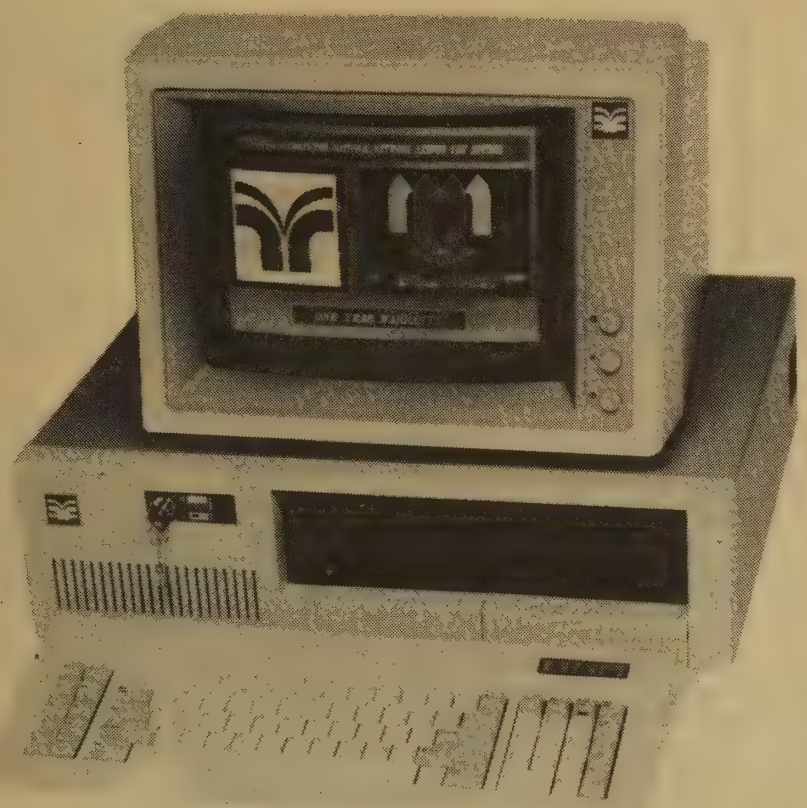

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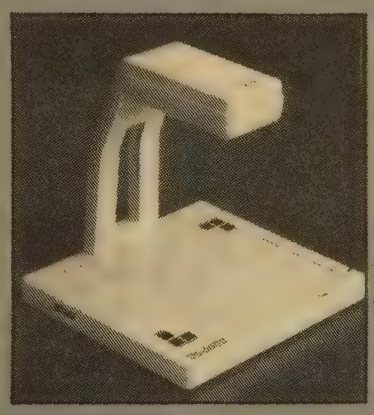

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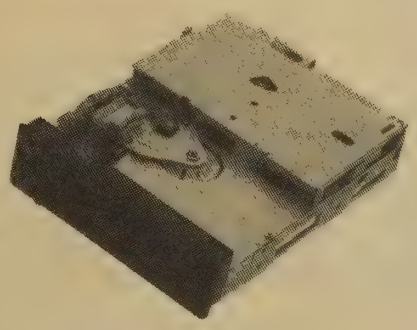

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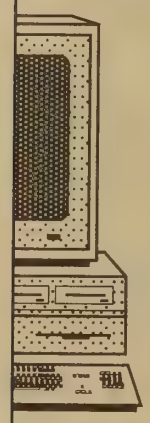

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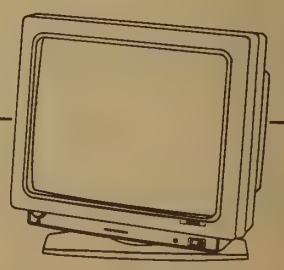

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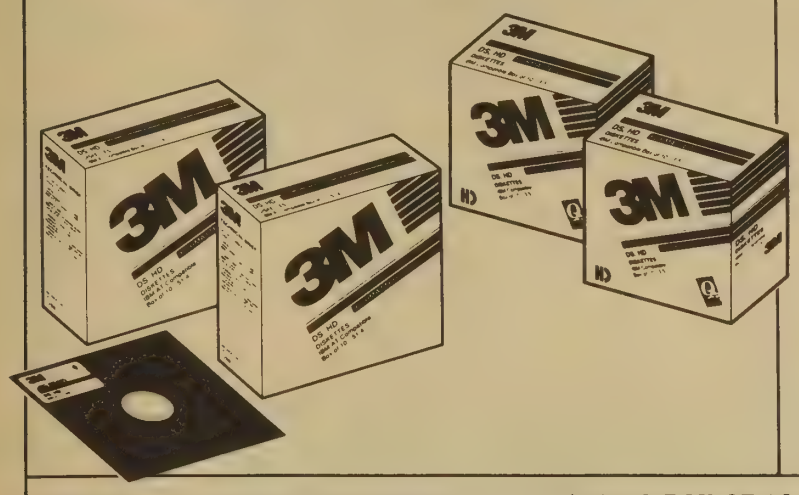

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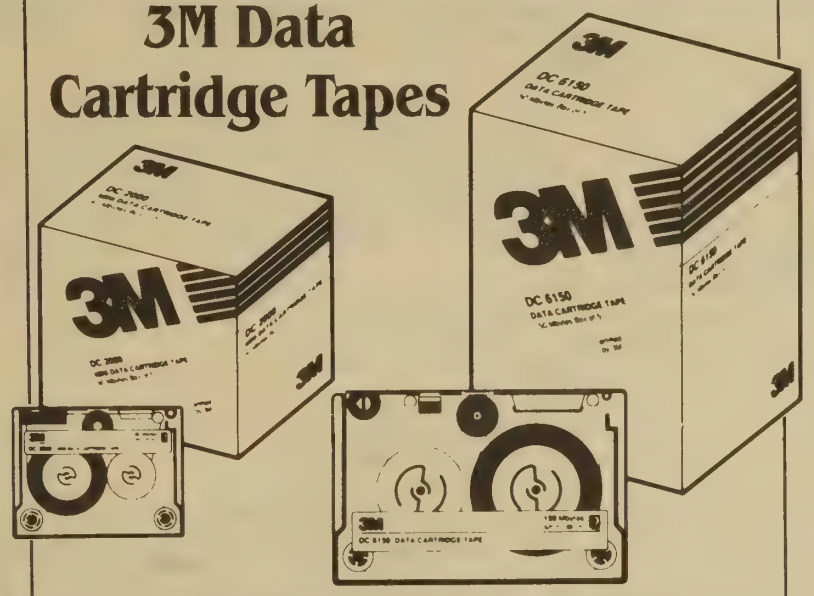

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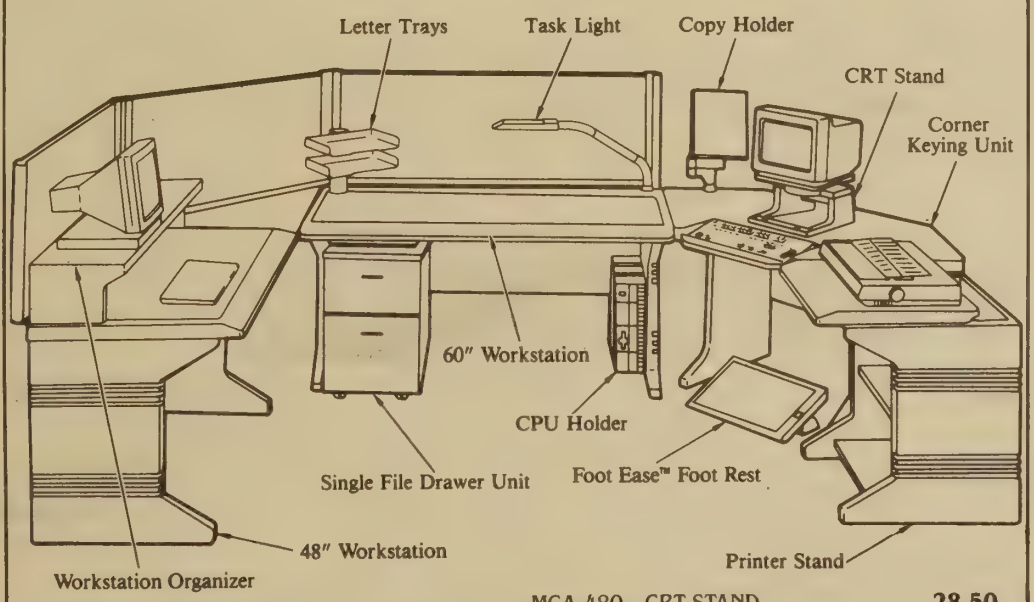

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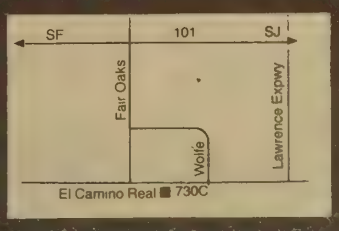

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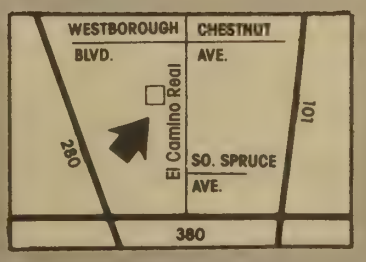

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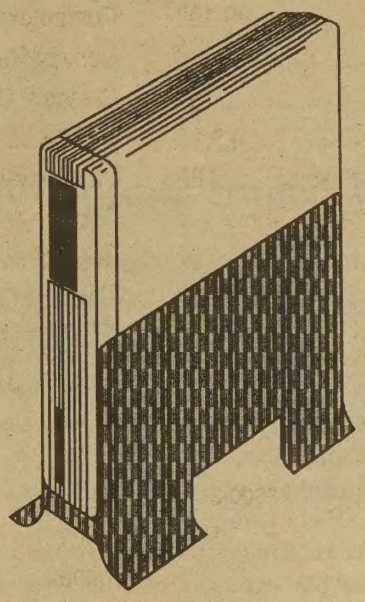

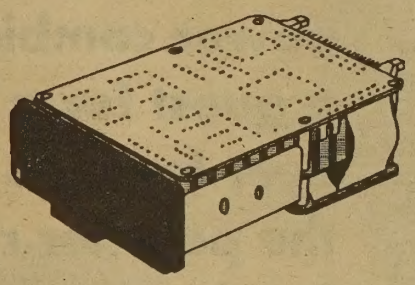

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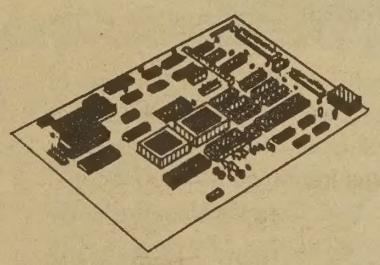

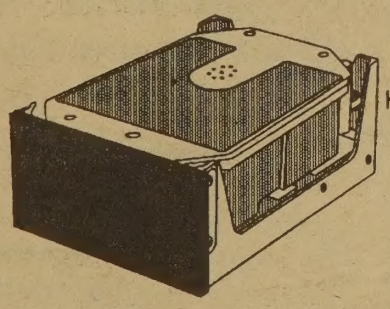

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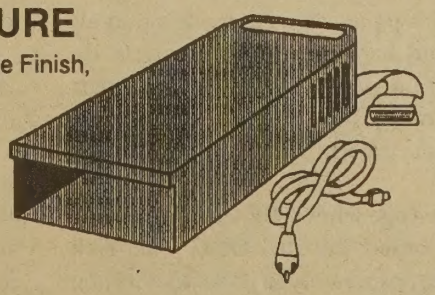

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DVORAK'S LAST COLUMN • BY JOHN C. DVORAK

THE 2090 DISASTER

A Tale Of Future Doom With A Happy Ending

The year is 2090. It's the end of the century. Retrospectives are being written. Predictions are being made. Meanwhile, the same dullards are around as universal characters in some non-stop play telling us that 2090 is technically still in the '80s because all decades start with the year one. Right. Hey guys, the first decade was a year short, ok?

Of course, this nonsense meant nothing in 2090 when you discover that a genetic engineering fluke resulted in mass deaths. The constant drive for more and more computer power combined with a quest for a better beer formula were the peculiar reasons for the disaster. James Burke would have loved this coincidence.

Ever since the year 2000, things have changed radically, especially computer technology, which went biological in 2033 when Dr. Maximillian Dawes Schell genetically engineered the first living microprocessor—a four-bit flea. Dr. Schell, great-great-great grandson of comic/actor Ronnie "Did I hear someone say Deal!?!" Schell, perfected his invention, and by 2090 all the computers of the world were bug-based.

The problem, though, was the latest iteration of the bug-processor, one based on a horsefly. It had become so hard to debug, as it were, that progress had slowed. People were blaming the microbe code, an invention of the Tick Corporation, the early pioneers in bug-processors. Nowadays the buzzword, and I do mean buzz, was RIISC (Reduced Instruction Insect Computer) and the RIISC fly. A couple of new kids on the block and the big mainframe company, IBM (Insect Business Machines) had all developed RIISC flies. The RIISC fly was half the size and twice the speed of the Tick Corporations horsefly. The Tick Corporation called these new companies "the enemy," knowing that RIISC flies would screw up the monopoly Tick Corporation held in the world of pocket and personal computers.

All the while, the Japanese were working on all sorts of insects and had discovered a way to do parallel processing on a dragonfly. This was all part of its 15th Generation project founded by the arrogant Japanese trade association MITI (Marketing Insects To Idiots).

It was about a year ago when THE big mistake was made. It is now called the BIG ONE. The Tick Corporation, trying desperately to prove that its bug design was better than that of the RIISC designers, accidentally engineered a gene that would kill half the world's population. The gene, designed to do pipelining when incorporated into the Horsefly 666 processor, somehow got tangled up with an ale yeast cell and got into a batch of unfinished homebrew being made surreptitiously under one of the lab benches by one of the technicians. The technician owned a local brew pub and spent most of his time developing new beer formulas. It's hard to figure out how this switcheroo happened, but it did. The technician died early in the scenario and could never explain how he stole the gene. Before anyone knew what was happening the yeast was sold to a yeast distributor, and soon the world's entire supply of yeast had the strange gene attached.

Somehow the gene would, when ingested as part of the yeast cell, break away from the yeast and implant itself into the brain of the, say, beer drinker. The pipeline mechanism would take over all brain functions, and the hapless person would be unable to do anything but the one thing they were doing when the pipeline effect on the brain occurred. Some couldn't stop walking. Some were stuck watching TV. You can imagine what happened to the more amorous individuals when this happened.

Anyway, for reasons unknown, only direct descendants of the few people who were suckered into receiving the Swine Flu vaccine in the 1970s seemed immune to this effect. The yeast cells were in bread, in the water, everywhere.

Needless to say the Tick Corporation was burned to the ground and all the executives, if they were still alive, were shot and eaten. Oh yes, and by the way, cannibalism had emerged as a viable way to avoid infection.

In no time people were dropping like flies, unable to stop doing what they were doing. Starvation or falling off a bridge were the most common forms of death. Few knew if they were immune, so everyone was paranoid. Needless to say, the big beer companies went beer-belly-up. Wine couldn't be drunk and vinegar couldn't be made, so all the gourmet restaurants in the world went broke, having relied too long on exorbitant bar tabs to turn a profit. Life looked bleak. Food looked bland.

It was 2090, and Dr. Maximillian Dawes Schell came back onto the scene to save the day for all mankind. He found a way to create another yeast with memory and a CPU that could be ingested and be preprogrammed to alleviate the peculiar infinite loop caused by the pipeline module. It essentially turned off the other mechanism. Dr. Schell couldn't get FDA approval for this invention, so he simply dumped it into the water supply and made an announcement. Word soon got around that the cure was in the water and the disease was abated. Schell was imprisoned for violating federal law and was savagely beaten to death in a holding cell by a crazed street juggler who mistook him for a producer.

Soon the world was back to normal.

There is, of course, an obvious moral to this story. Promoting and pushing old technologies in the face of change will always lead to disaster. You've all been warned. ■

A genetic engineering fluke resulted in mass deaths. The constant drive for more and more computer power combined with a quest for a better beer formula were the peculiar reasons for the disaster. James Burke would have loved this coincidence.

John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine *and* MacUser, *considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

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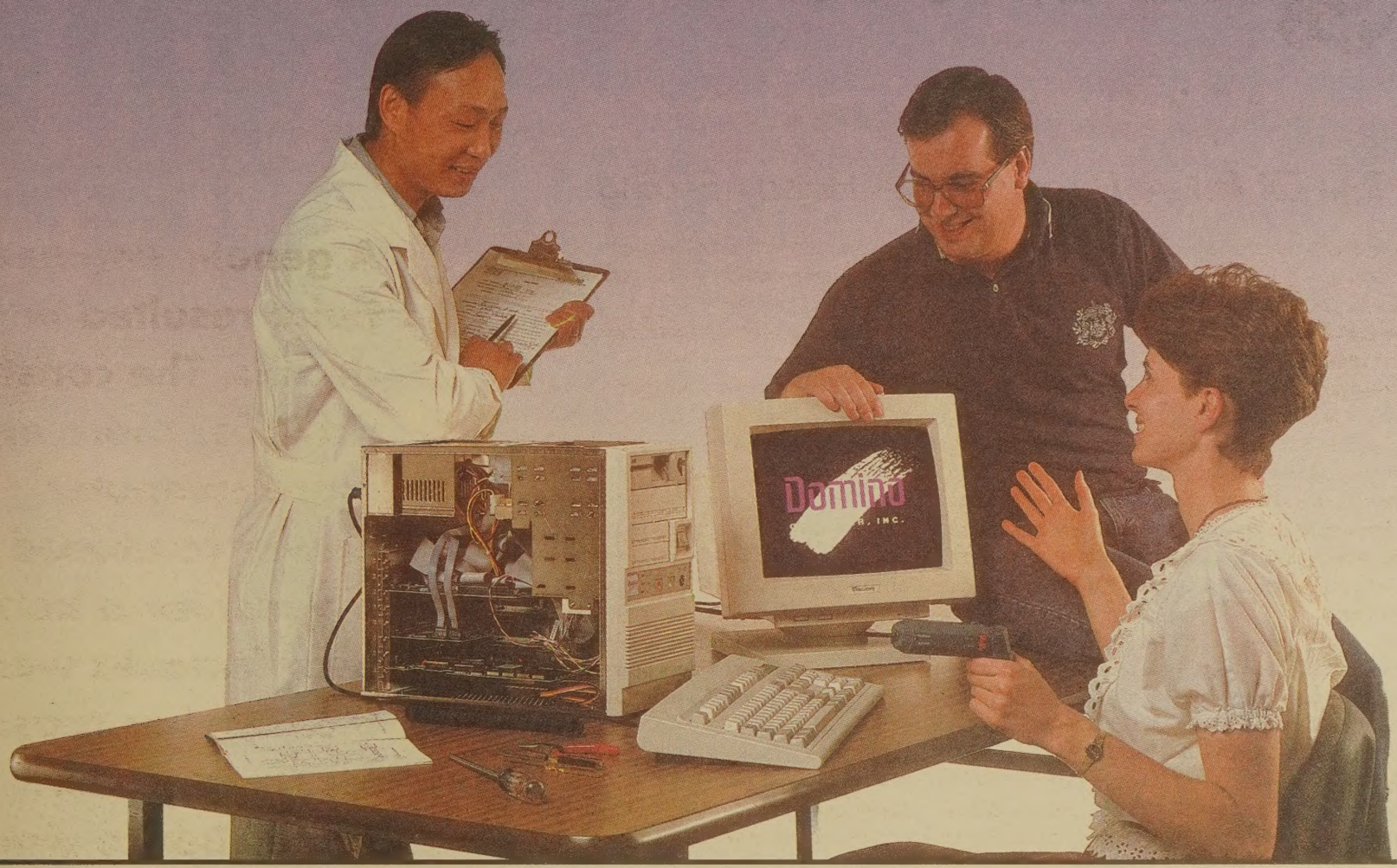

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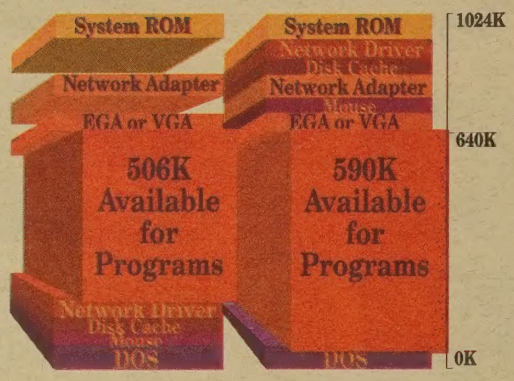

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